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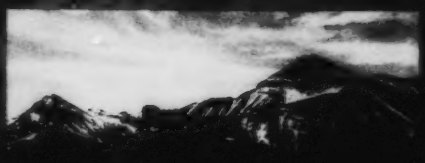
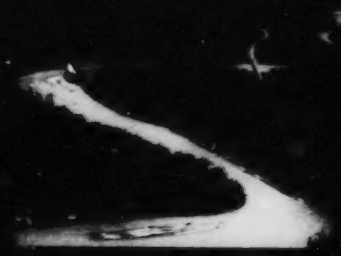
Coal Branch

Sub-Regional Integrated Resource Plan





Alberta
FORESTRY, LANDS AND WILDLIFE

COAL BRANCH

SUB-REGIONAL

INTEGRATED RESOURCE PLAN

Approved by the Economic Planning
Cabinet Committee on August 28, 1990

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Edmonton

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PREFACE

This planning document was prepared by government agencies and public consultants in recognition of the need for improved management of Alberta's lands and resources. It applies only to public lands within the Coal Branch planning area, not to private or federal lands.

The plan presents the Government of Alberta's resource management policy for public lands and resources within the area. It is intended to be a guide for resource managers, industry and the public with responsibilities or interests in the area, rather than a regulatory mechanism. Resource potentials and opportunities for development are identified with a view to assisting in the economic progress of Alberta. The plan is sufficiently flexible so that all future proposals for land use and development may be considered. No legitimate proposals will be categorically rejected. Energy resource decisions are subject to the application of regulatory approval processes under the jurisdiction of the Minister of Energy. This plan may influence regulatory decisions, but will not result in the categorical approval or rejection of energy proposals.

The provincial government is committed to serving Albertans. Should a proposal not be in keeping with the provisions of the plan, staff will work with the proponent to explore alternative means for accommodating the proposal in a more appropriate location, either in this planning area or on other public lands. The rejection of any proposal will be done only in writing by the Minister of Forestry, Lands and Wildlife or his designate.

A detailed outline for implementation will be provided for this sub-regional plan in order to identify the necessary implementation actions and roles. This implementation outline will also provide for the periodic review of the plan so that it may accommodate changing needs and situations. Wherever possible, the private sector will be provided with the opportunity to be actively involved in the operational delivery of the plan.

Implementation is subject to the normal budgetary approval process. In establishing overall priorities, opportunities in other planning areas and areas currently outside the planning process will be considered.

While the plan identifies resource potentials and opportunities, the realization of these may require the dedication of major amounts of public funds. The plan will be used on the understanding that any actions required for implementation will be undertaken only as budgetary approvals are given in the normal way. The private sector will be given the first opportunity to provide any development required.

This plan has no legal status and is subject to revisions or review at the discretion of the Minister of Forestry, Lands and Wildlife.

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1.0 INTRODUCTION

A Policy for Resource Management of the Eastern Slopes (Eastern Slopes Policy), approved by provincial Cabinet in July 1977 and revised in 1984, identifies integrated resource planning under a comprehensive interagency approach as being the means for effective management of the resources of the Eastern Slopes Region of Alberta. To implement this policy, the Resource Planning Branch of the Department of Forestry, Lands and Wildlife has been given the responsibility of coordinating the preparation of integrated resource plans on a priority basis for agencies with resource management concerns for public lands and resources within designated planning areas.

1.1 Purpose of Plan

Integrated resource plans have been completed or are under preparation for selected areas of the Eastern Slopes Policy region. The Coal Branch Sub-Regional Integrated Resource Plan will serve to effectively mitigate conflicts between resource use objectives by determining resource priorities and allocating land uses for specific portions of the Coal Branch planning area. The plan applies only to public lands, not to private or federal lands. In May 1984, the Resource Integration Committee (a provincial director-level committee) identified the Coal Branch area as a priority for development of a resource plan.

1.2 Planning Area

Location

The Coal Branch planning area (Figure 1) encompasses approximately 8400 km^2 (3244 sq. mi.). Generally, its boundaries are Jasper National Park to the west, the Athabasca River Valley and the Yellowhead Corridor to the north, parts of the watersheds for the Brazeau and Pembina rivers to the south, and Whitecourt Forest and the town of Edson to the east. Looking west, the terrain is mountainous while towards the east, it is mainly boreal forest uplands, foothills and some plains.

Resource Summary

This planning area contains a variety of renewable and non-renewable resources.

At present, there are three coal mines operating in the area. Two other projects have been issued mine permits and are awaiting growth and stabilization of both international and domestic coal markets. Preliminary disclosures of six coal projects have been recognized by the government as being consistent with government policies or intentions for these areas. Most of the coal rights are under disposition. The potential of the coal reserves and the present infrastructure makes this area attractive to the coal industry.

The planning area contains large reserves of natural gas in 24 designated petroleum and natural gas fields, with some petroleum in two of these fields. There are 11 gas processing plants, two of which produce sulphur. Most of the petroleum and natural gas rights are under disposition. More exploration to define the potential reserves will occur.

One limestone quarry operates at Cadomin. Additional limestone sources, other quarriable rock and aggregate all occur in the Coal Branch.

Most of the area is held under a Forest Management Agreement (FMA) with Weldwood of Canada Ltd. The FMA is established by order-in-council. The agreement gives the company the right to manage the area to grow, harvest and reforest timber on a sustained-yield basis.

Small operators hold dispositions on most of the remaining merchantable timber. Some timber is also available for local use. The merchantable timber resource of the Coal Branch is fully committed and the market for forest products is strong. The identification, protection and management of the forest land base is critical to meet and maintain existing timber commitments. Intensive forest management practices and multiple land use within a commercial forest context will ensure expansion in the industry.

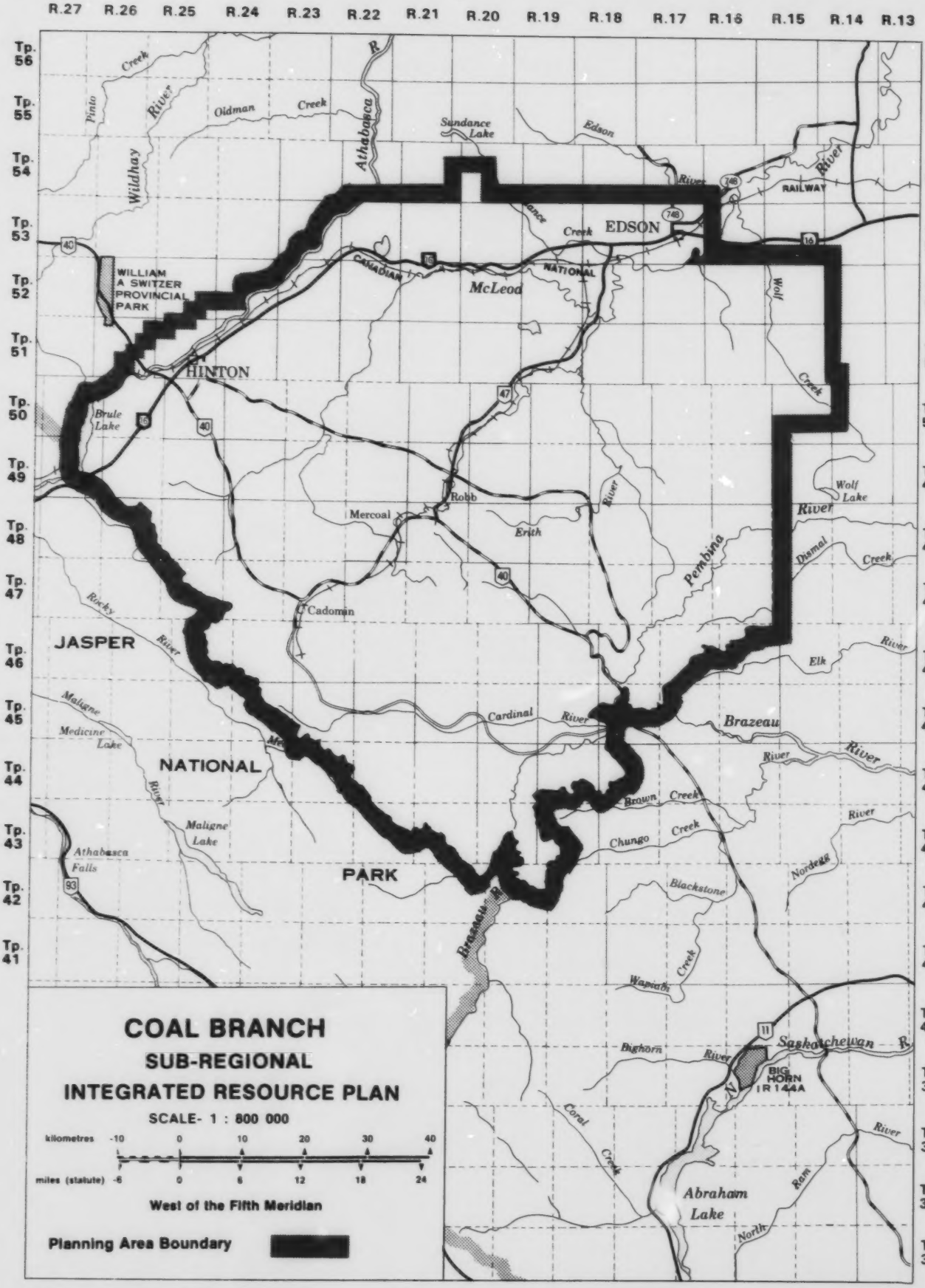

Figure 1: Coal Branch Planning Area.

Most of the planning area is drained directly by the Athabasca River or by its tributaries, the McLeod and Pembina rivers. The southern portion drains into the North Saskatchewan River by a tributary, the Brazeau River. Surface water is used as supply for industry and municipalities, as well as to provide fisheries habitat and recreational opportunities. The groundwater of the area is similarly used for both industrial and municipal supply. Water flowing into the Brazeau River is used for hydro-electric power generation.

The wildlife resource has significance for both commercial (trapping and outfitting) and recreational (consumptive and non-consumptive) uses. Important habitat for elk, moose and deer exists in the Athabasca, McLeod, Pembina, Brazeau and Cardinal river valleys. Lovett Ridge, Mountain Park and several small drainages also provide important elk habitat. The front ranges provide habitat for local populations of bighorn sheep and mountain goat. Trumpeter swans, classed as a threatened species in Alberta, nest in several lakes and ponds in the northern portion of the planning area.

The area includes good recreational fisheries. The major river systems offer stream fishery opportunities. Regionally significant lake fisheries include Fickle, Obed, Fairfax, Muskiki, Mary Gregg, Wildhorse, Kinky, Kia Nea, Millers and Mystery lakes, Lamberts and Eccles ponds, and the Pedley Reservoir.

Recreational use of the area has gained importance in recent years. There are many opportunities for extensive recreation such as hunting, fishing, canoeing, off-highway vehicle and equestrian use, hiking, auto-touring, cross-country skiing and snowmobiling. Most users are either local or from the Edmonton area.

Tourism activities in the area are strongly tied to outdoor recreation and touring, and depend upon the scenic landscape, wildlife, fisheries and historical resources of the area. To date, there has been limited development of tourism facilities. The Yellowhead Highway is the major east-west corridor through the region. Edson and Hinton serve as major service centres for the region's recreation and tourism activities. Smaller communities such as Robb and Cadomin provide some services and seasonal residences for recreationists. Potential exists to develop the region's recreation and tourism resources further.

In the planning area, 125 archaeological sites have been identified as a result of studies on proposed road alignments and coal-mines, particularly along the Lovett and Embarras rivers. Additional sites may be present and could be discovered in such locations as exposures along stream and river valleys as well as in outcrop materials along steep slopes and in road cuts. Palaeontological discoveries include dinosaur bones, fossilized stumps, leaves and some important fish fossil sites. Most palaeontological sites are exposed along stream and river courses, steep faces and the tops of many of the ridges. Overall, the area has high potential for the discovery of historic resources, especially in association with coal mining and fur trapping.

Agricultural land use is very limited, but cultivated crops are found in the Edson area. The Sang Lake provincial grazing reserve is located southeast of Edson. There is some limited forage production and improved pasture along Highway 16 in the Edson and Hinton areas. Most of the grazing outside the Edson area is associated with recreational horse use. Grazing within the Edson area is mainly for cattle.

Most of the people in the planning area reside in the towns of Hinton and Edson. Smaller uncorporated centres include Robb, Cadomin and Marlboro. Small Boys Camp, an unauthorized Treaty Indian encampment, is also located within the planning area. Major employers in Hinton include the forest and coal-mining industries, and some provincial and federal government offices. Major employers in Edson include the oil and gas field servicing industry, the coal-mining industry, the forest industry, the agricultural industry and regional provincial government services.

Major public roads include highways 16, 40 and 47, and the Grave Flats Road (along the Cardinal River). In addition, there are many resource roads, including timber haul roads, oil and gas exploration and development roads.

The main line of the Canadian National Railway follows the Yellowhead Corridor. A branch line (the Coal Branch)

extends from near Bickerdike to Coal Valley, Hanlan, and the Cardinal River and Gregg River coal-mines near Cadomin.

Two airports are located within the planning area. The Hinton/Jasper airport is located west of Hinton and the Edson airport is located within the town of Edson.

1.3 Planning Process and Participants

Process

The general purpose of the integrated resource planning process is to provide direction for the management of resources within the Coal Branch planning area. The process attempts to integrate government resource planning initiatives by clarifying resource management objectives and guidelines, and by resolving identified conflicts or concerns. The process also geographically locates resource management objectives by confirming or revising the Eastern Slopes Policy regional zoning boundaries.

The planning process for development of sub-regional integrated resource plans consists of a series of interrelated action steps. The steps are sequential with the exception of the data gathering and analysis step, which can occur throughout the process. The process is also flexible in that the sequence of events may be interrupted to return to a previous step, if required.

Preparation and approval of the terms of reference is a major element of the plan initiation step of the planning process. An interdepartmental planning team prepared a draft terms of reference which was reviewed by the public in February 1985. Comments received from the public were considered before this document was approved in February 1986. The terms of reference presents a description of the planning area, the purpose of the plan, a review of existing resource management policy direction, major resource management concerns and issues, and a brief explanation of the decision-making process.

Preparation of the terms of reference was followed by the initiation of data collection and analysis, which was ongoing throughout the development of the plan. The resource management agencies collected and analyzed data in the categories of present use, demand, potential and capability for a wide variety of resources. This information was used in the development of resource management objectives and guidelines and in the resolution of identified conflicts. The next step was development of the draft plan.

Public input was a part of draft plan preparation. Public input from two public reviews of the draft plan was considered in preparing the Coal Branch plan. There was an informal public review of the May 1987 draft plan, and 17 meetings were held upon request. A total of 93 submissions and a petition were received. The informal public input from the May 1987 draft plan was considered in preparing the September 1988 draft plan. A formal public review took place in November 1988 on this draft and a total of 165 submissions were received. There were four meetings and three open houses held in Hinton, Edson and Stony Plain. Overall, the public interest and input for this plan has been good.

The draft plan was endorsed by a number of interdepartmental provincial government committees before approval by the Economic Planning Cabinet Committee.

Participants

A planning team approach is used in the development of integrated resource plans. The planning team consists of representatives from government agencies who have major responsibilities or interests in resource management in the Coal Branch planning area, plus a team coordinator who is responsible for the overall coordination of plan development. The Coal Branch planning team consists of representatives from the following provincial government agencies.

1. Alberta Forest Service, Forestry, Lands and Wildlife
2. Fish and Wildlife Division, Forestry, Lands and Wildlife
3. Public Lands Division, Forestry, Lands and Wildlife
4. Minerals Resources Division, Energy
5. Energy Resources Conservation Board
6. Tourism
7. Culture and Multiculturalism

Representatives from the Land Information Services Division completed an integrated resource inventory for the Coal Branch planning area, and provided further advice and interpretation on the physical land information when required by the planning team.

Designated consultants provided input to the planning team at key stages of the planning process. Consultants to the team include representatives from Alberta government agencies, a federal agency, a regional planning commission and local governments.

Representatives from the provincial departments include:

1. Agriculture
2. Environment
3. Municipal Affairs
4. Recreation and Parks
5. Transportation and Utilities

The local governments include those for the towns of Edson and Hinton, as well as the Improvement District of Yellowhead, No. 14. The Yellowhead Regional Planning Commission provided regional input.

The Parks Service of Environment Canada was the federal government consultant.

The Member of the Legislative Assembly for West Yellowhead was also kept informed of the plan's progress.

2.0 BROAD RESOURCE MANAGEMENT DIRECTION

2.1 Policy Context

Legislation and Associated Directives

Various provincial government agencies administer a range of legislation and associated regulations to manage resources throughout Alberta, including those within the Coal Branch planning area. In addition to legislation and regulations, there are also governmental directives, such as orders-in-council and ministerial orders, that affect resource management activities. This section does not attempt to list all the applicable government directives; it highlights those that are most applicable.

All but two townships of the Coal Branch planning area are in the Green Area, which was established by order-in-council in 1948. The Green Area contains lands not available for settlement or agricultural development other than grazing. The two townships outside the Green Area are within the White Area, which represents the settled land in the province that may be made available for agricultural development.

A Policy for Resource Management of the Eastern Slopes

A Policy for Resource Management of the Eastern Slopes Revised 1984 (Alberta 1984) provides guidelines and objectives for integrated resource management and planning for the entire Eastern Slopes region, including the Coal Branch planning area. The Eastern Slopes Policy relies on regional land use zoning to designate land areas for varying degrees of protection, resource management and development. The overriding principle for all the zones is to protect the valuable water resources of the Eastern Slopes, and to provide for public land and resource use in a manner consistent with principles of conservation and environmental protection. The zoning does not apply to privately owned lands in the planning area. Refer to Table 1 of Appendix A for the general intents of the following eight land use zones: 1) Prime Protection; 2) Critical Wildlife; 3) Special Use; 4) General Recreation; 5) Multiple Use; 6) Agriculture; 7) Industrial; and 8) Facility. Table 2 of Appendix A defines a range of compatible activities to enact the intent of the eight land use zones. The compatible activities table and regional zoning provide interim direction until sub-regional integrated resource plans are completed.

The Coal Branch Integrated Resource Plan supersedes the zoning configuration set down in the Eastern Slopes Policy. As a result, the zones have been refined and the regional zoning and the Table of Compatible Activities found in the Eastern Slopes Policy no longer apply in the planning area. Figure 2 shows the revised zoning.

A Coal Development Policy for Alberta

A Coal Development Policy for Alberta (Alberta, 1976) guides the exploration and development of coal resources throughout the province. Under the Coal Policy, exploration and development of coal deposits are permitted only under strict control to ensure environmental protection and satisfactory reclamation of any disturbed land. The policy includes a land classification system that considers environmental sensitivity, alternate land uses, potential coal resources and infrastructure.

The Coal Policy also provides a broad framework of procedure for considering applications for new coal developments. This is a four-step process that includes:

1. Preliminary disclosure to government and the government's initial response.

2. Disclosure by the applicant to the public.

3. Consideration through a public hearing, if appropriate, of the technical application, cost-benefit and social impact analyses, environmental impact assessment and land surface reclamation plan.

4. Final decision by the government in light of the findings of the Energy Resources Conservation Board,

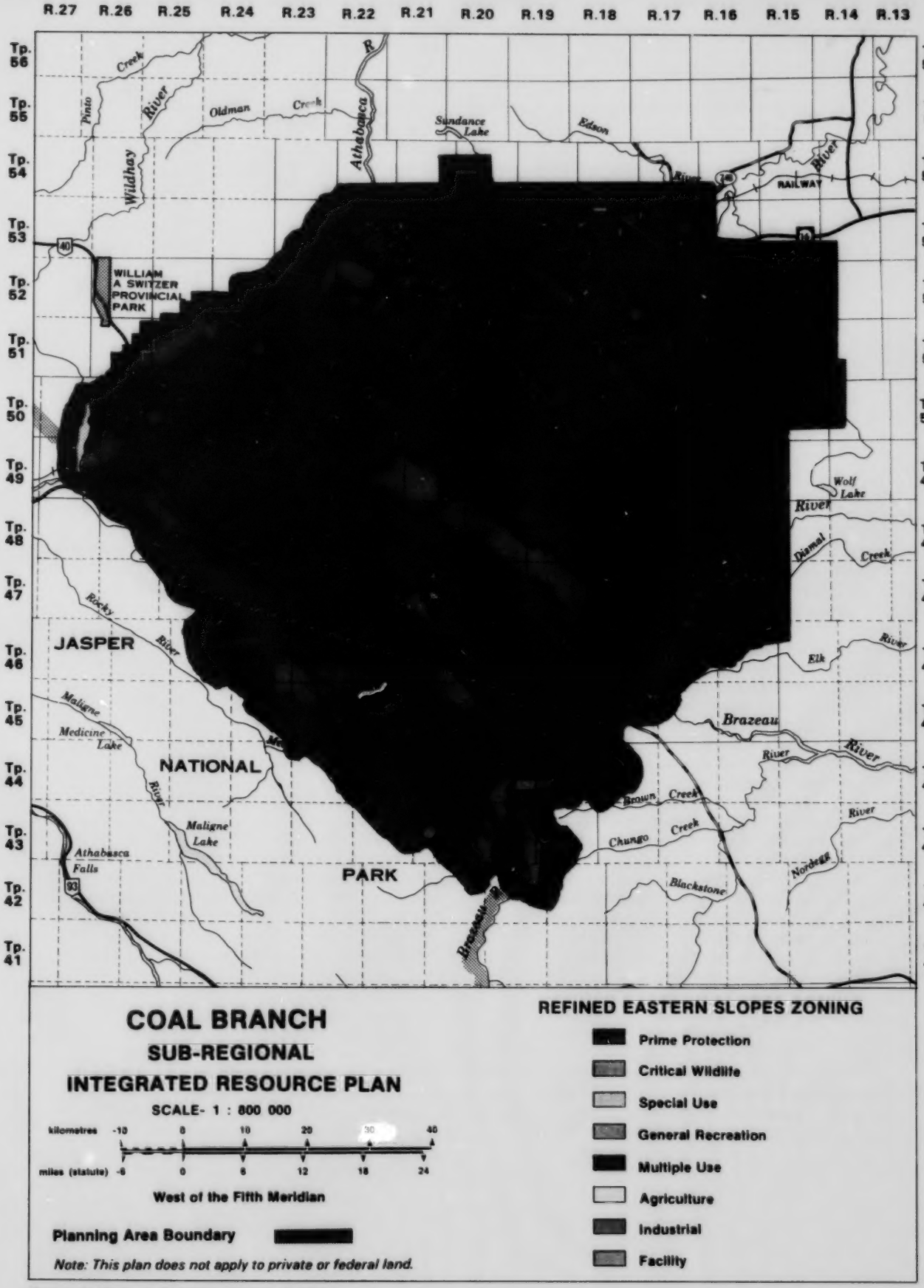

Figure 2: Refined Eastern Slopes Zoning.

Alberta Environment and other concerned agencies.

Integrated Resource Management and Planning

The Alberta Government is responsible for management of the provincial resource base, and works to optimize the use of all natural resources in order to provide maximum benefits for Albertans, now and in the future. The government is committed to an integrated approach to resource management that recognizes management and use of one resource may affect management and use of another resource. Integrated resource management attempts to reduce or resolve any negative interactions and enhance or promote positive interactions between resource management and use activities. Cooperation, communication, coordination and comprehensive consideration of resource values are fundamental aspects of the concept of integrated resource management.

Integrated resource planning is a decision-making process that is an integral component of integrated resource management. In integrated resource planning, the resource planning initiatives of various government agencies are compared and subsequently confirmed or modified to achieve a planning product that is acceptable to all the involved agencies. An integrated resource plan provides direction for field-level resource management decision-making in the form of a set of resource management objectives and a course of action to achieve those objectives. The Coal Branch Integrated Resource Plan was developed in the context of integrated resource management and planning.

For a discussion of legislation and other associated direction directly related to this plan, refer to APPENDIX A.

2.2 Primary Plan Intent

The balance of this chapter consists of a statement of intent for resource management within the planning area plus a set of broad resource objectives and guidelines that apply to the entire planning area. A resource summary is also provided for each resource sector.

The **primary intent for resource management** for the Coal Branch planning area is:

> **To achieve long-term, continuous, social and economic benefits by providing for the optimal use of all available resources, while maintaining the overall integrity of the natural environment and the high aesthetic value of the area.**

The Coal Branch plan was developed within the scope of the following broad resource management objectives. These broad objectives provide future standards that participating agencies will strive to attain. They reflect government priorities for the Coal Branch sub-region within the context of the Eastern Slopes region and are expressed as they relate to a particular resource. Broad resource management guidelines follow the broad resource management objectives. The guidelines state how the objectives will be achieved.

Aside from recognizing watershed management as the highest priority in the overall management of the area, the other broad resource management objectives and guidelines are not presented in order of importance.

2.3 Water and Watershed

The Coal Branch planning area is drained by the Athabasca and North Saskatchewan river systems. These river systems are important sources of supply, and the demands are high for water in sufficient quantity and quality for municipal, agricultural, industrial and instream purposes. In the planning area, municipal and industrial sectors (natural gas processing and coal washing plants) are important users of the river system, both as sources for water withdrawals and as areas to receive discharge of wastewater.

Generally, soils and surficial deposits in the Coal Branch are finer and more erodible in the eastern half and coarser and more stable in the western half. The slopes are steeper in the western half of the planning area. This

watershed produces relatively high volumes of clean water. Both the Athabasca and North Saskatchewan rivers supply large volumes of water for consumptive and non-consumptive uses. Changes in land use activities may result in an increase in surface runoff and a deterioration in water quality.

Objectives

1. To ensure that land use activities are managed to provide optimal water yield in terms of quality, quantity and timing.

2. To maintain the long-term integrity of natural watercourses and ensure protection of the watersheds.

3. To minimize erosion and soil losses resulting from land use activity.

4. To ensure that reclamation guidelines and standards minimize soil erosion and protect inherent soil productivity.

Guidelines

1. Future land use and resource developments that may alter water quality, quantity or flow regime will be reviewed so adverse impacts can be assessed and minimized as required.

2. Operational guidelines/ground rules for land use and resource developments will be followed to ensure adequate protection of soil and water resources.

3. Sites with sensitive soils or vegetation will require intensive site specific planning and closely supervised development.

4. Watershed values (e.g., potential of soil erosion) will be considered in all land management or resource development plans.

5. Reclamation of land use disturbances will proceed on a progressive basis to reduce erosion and sedimentation. Reclamation will be included as a condition of surface disposition approvals and completed according to provincial standards.

6. Flood-prone areas will require intensive planning and close supervision of activities and developments.

2.4 Minerals

Coal - Coal development in the Coal Branch dates back to the turn of the century and increased until the 1950s when railways converted to diesel fuel. Major coal development then occurred as the demand for both metallurgical and thermal coal grew in the late 60s and 70s. Coal production in 1984 was just under eight million tonnes (about half metallurgical coal and half thermal). The extent of existing coal deposits presently proven in the planning area contains a total of nearly three billion tonnes of coal. Much of the coal rights are under disposition. Today, there are three coal-mines operating in the Coal Branch. Two other projects have been issued mine permits and are awaiting growth and stabilization of both world and domestic coal markets. Preliminary disclosures of six coal projects have been recognized by the government as being consistent with government policies or intentions for these areas. With exploration, the more promising coal deposits are proven and reserves are increased.

The Coal Branch area is important for the development of high quality coals because of geology and the existing infrastructure.

Petroleum and Natural Gas - The planning area contains large reserves of natural gas in 24 designated petroleum and natural gas fields, with some petroleum in two of these fields. The Hanlan and Edson fields are the two biggest gas fields. There are 11 gas processing plants of which the Robb Hanlan and Dome Edson plants produce sulphur. Sixty percent of the petroleum and natural gas rights of the planning area are under disposition to industry, and increasing exploration, reserves and production are expected.

At present, natural gas reserves are approximately 70 billion m^3 with production at 1.4 billion m^3 yearly. This forms 3.7 percent and 2.1 percent, respectively, of provincial reserves and production.

Quarriable - One limestone quarry operates at Cadomin. Large sources of limestone, other quarriable rock and aggregate are present in the Coal Branch.

Objectives

1. To provide opportunities for industry to define the extent of mineral resources, and to develop and/or produce mineral resources where proven reserves or productive formations exist.

2. To provide opportunities for the orderly exploration and development of mineral resources in previously unexplored areas and formations.

3. To provide for the orderly exploration and development of surface materials, including sand, gravel, clay and marl, in a manner that is compatible with environmental considerations.

Guidelines

1. Mineral exploration and development will follow the existing approval processes.

2. In general, mineral development will not be allowed in Zone 1. However, applications to allow development on existing coal leases in Zone 1 will be considered. Public review will be coordinated at the public disclosure stage of a coal development proposal and the plan amendment stage.

3. Exploration and development of mineral resources will be permitted in Zone 2 under the existing approval processes provided the value of the area to wildlife can be maintained. Mineral activities should attempt to avoid important habitat areas as much as possible. Where avoidance is not possible, the project must be designed to minimize disturbance of wildlife habitat and undertake mitigative measures to maintain habitat capability in or adjacent to the project area. Reclamation will have wildlife habitat as a high priority in Zone 2.

4. Minesites and other surface disturbances will be progressively reclaimed with the objective focusing on an end land use, or for the purpose of optimizing the value of watershed, timber, wildlife, tourism, recreation or other post-mining uses. This progressive reclamation ensures the land is returned to a state that will allow levels of sustained use at least equivalent to those existing before development.

2.5 Timber

Initially, timber was commercially harvested to supply the coal mines and mining communities. Since the 1950s, the importance of forest products has grown, with timber products being produced for export from the area. The Coal Branch contains eight complete Forest Management Units (FMUs E1, E3, E1N, E4N, E5, E9, H1 and E11) and portions of three other units (EO1, E2, E4). (See Appendix B.) All of E1N and E4N and parts of E11 and E5 are within Weldwood of Canada Ltd.s' FMA area. The FMA gives Weldwood the right to manage and harvest coniferous timber in these units. They also have an option on the deciduous timber until June 15, 1993. The remaining FMUs have a variety of deciduous and coniferous timber commitments. Coniferous timber quotas are held in FMUs E1, E2, E5 and E11. Timber quotas are held by individuals or companies and are long-term (20-year), renewable commitments of a percentage of the annual allowable cut of a unit. Deciduous timber allocations are held in E1 and E2. These are similar to coniferous timber quotas except they provide for an annual cut of deciduous timber. Miscellaneous Timber Use (MTU) areas have been set up in E1, E2, E5 and E9. These areas are set up to provide timber to local residents and small logging operators through the issuance of short-term local timber permits.

The merchantable timber resource of the area is fully committed to industry and public use (i.e., other multiple land uses including recreation, wildlife and watershed protection). This area is recognized as a commercially productive forest land base. The

protection and management of the forest land base for sustained-yield timber management is critical to meet and maintain these timber commitments.

Objectives

1. To provide a continuous supply of deciduous and coniferous timber for industry (FMA and quota) and local use.

2. To encourage maintenance and, where possible, increase the level of use of deciduous and coniferous timber from the land base, which is managed for sustained yield.

3. To increase the productivity of the sustained-yield management area for the production of timber.

4. To ensure maximum economic use of the timber resource.

5. To ensure that timber harvesting is conducted in a manner that retains the visual quality of the area.

6. To protect forested areas from damage and destruction by insects, disease, fire or other threats.

7. To minimize the risk of wildfires as a result of resource development, settlement and recreation.

8. To ensure, through forest fire protection, that no more than an average of 0.1 percent of the planning area burns per year.

9. To ensure the forest productivity on reclaimed land is at least equivalent to that which existed before the disturbance from resource development.

Guidelines

1. All impacts on the existing land base which is managed for sustained yield, must be minimized.

2. Intensive forest management practices (i.e., thinning, fertilizing) will be used to increase productivity of the land base, which is managed for sustained yield.

3. Timber salvage operations will be coordinated with coal-mining and other land use activities.

4. Integrated timber planning and harvesting of both deciduous and coniferous species will be encouraged to achieve full timber resource utilization.

5. The Forest Landscape Management Strategies for Alberta (Alberta, 1988c) will be used to minimize the impact of harvesting operations on visual resources.

6. Fire management and risk planning will be carried out to maintain public safety and forest productivity.

7. Forest management activities will follow the forest management plans, and be consistent with the management direction identified in this integrated resource plan.

2.6 Wildlife

The Coal Branch planning area contains a wide diversity of wildlife species and habitat types. Large mammals found within the planning area include bighorn sheep, mountain goat, elk, moose, white-tailed deer, mule deer, black bear, grizzly bear and cougar. The area supports a range of furbearers including beaver, coyote, wolf, marten, lynx, muskrat, mink, fisher, river otter and red squirrel. A large variety of small mammals and birds are also present. Rare and threatened wildlife species (as defined by the Committee on the Status of Endangered Wildlife in Canada) include trumpeter swan, peregrine falcon and the long-toed salamander.

Habitat in the Coal Branch varies greatly. In the east, coniferous forests and organic fens are dominant. The high level of interspersion of cover and forage allows for moderate-to-high densities of moose. The valleys of the Athabasca, McLeod, Pembina, Brazeau and Cardinal rivers provide riparian

areas and associated river valleys that represent important habitat for elk, deer, moose and numerous non-game species of wildlife. The Whitehorse Creek and Prospect Creek areas provide regionally significant elk habitat into which elk have been transplanted to increase populations. The front ranges of the Rocky Mountains include critical habitat for high numbers of bighorn sheep and small populations of mountain goat.

The major consumptive uses of wildlife in the Coal Branch planning area are trapping (40 registered trapping areas) and hunting of elk, moose, bighorn sheep and deer. Big game hunters from across the province as well as non-residents hunt in the Coal Branch. Native hunting of wildlife is a significant activity in the area. It is carried out by residents of the area as well as Treaty Indians from other parts of Alberta.

Non-consumptive uses, such as viewing and photography, are popular in the Coal Branch, mainly in association with hiking, equestrian trail riding and camping. Off-highway vehicles access is a major disturbance factor for wildlife in some areas, and is not compatible with the wildlife management intent for those areas.

Objectives

1. To maintain the numbers, distribution and diversity of regionally significant wildlife species, and to increase numbers where projected public demand (for both consumptive and non-consumptive uses) exceeds current populations.

2. To maintain and/or increase the quality and quantity of suitable aquatic and terrestrial habitat required to support wildlife populations at optimal densities.

3. To maintain, increase or re-introduce rare and threatened species, including peregrine falcon, trumpeter swan and long-toed salamander.

4. To ensure that populations of elk, moose and deer are maintained or increased.

5. To maintain viable, abundant and diverse populations of furbearers, and to maintain a mosaic of habitat types.

6. To maintain existing populations of upland game birds.

7. To maintain the bighorn sheep population slightly below the carrying capacity (650-725 animals) of the range through non-trophy and trophy sheep harvests. To protect and improve sheep habitat (areas above 1700 masl [5577 ft.]).

8. To maintain available habitat for mountain goats to increase populations using the area on a seasonal basis, and to re-establish herds on historic range.

9. To maintain existing populations of non-game species of wildlife.

10. To continue the present wolf management approach (e.g., trapping, kill if problem wildlife situation).

Guidelines

1. A diversity of habitat types will be maintained to support a variety of wildlife species (including non-game and furbearers). This will be achieved through the Fish and Wildlife Division's input into development plans and through Fish and Wildlife enhancement programs.

2. A mosaic of forest cover and forage areas will be maintained to help increase ungulate populations. This will be achieved through the Fish and Wildlife Division's recommendations in logging plans, range improvement programs on public land and habitat enhancement programs.

3. Hunting seasons will be adjusted to meet wildlife population objectives.

4. Disturbance of wildlife populations during sensitive time periods will be minimized.

5. Disturbance of wildlife will be reduced by managing off-highway vehicle access and controlling hunting activities.

6. Regulation of animal densities will occur primarily by recreational and Treaty Indian hunting, and by commercial trapping.

7. Late winter disturbance in critical overwintering areas designated as Zone 2, will be kept to a minimum, especially during winters with deep snow and cold temperatures.

8. Closure of new access resulting from development work will be an integral part of industrial development in important wildlife areas.

2.7 Fisheries

The streams, rivers and lakes of the Coal Branch support a variety of sport fish including bull trout, rainbow trout, brown trout, brook trout, Arctic grayling, mountain whitefish, lake whitefish, walleye, northern pike and yellow perch. Low gradient streams are found in the eastern part of the Coal Branch. The numerous beaver dams built along these watercourses provide valuable pool and overwintering habitat. However, if the dams remain in place for many years, they can contribute to stream siltation as well as becoming barriers to upstream fish movement. In the western foothills and mountains of the planning area, higher gradient streams are common. In these streams, the primary habitat limitations are bed load movement through high flows and excessive stream siltation, both of which limit fish populations. The larger rivers in the Coal Branch provide a greater availability of pool and overwintering habitat. The important watercourses that have been identified as being regionally important spawning and rearing habitat for bull trout and rainbow trout include Eunice, Wampus and Deerlick creeks, the Cardinal River and its tributaries, and MacKenzie, Drinnan and Anderson creeks.

An extensive fish stocking program is undertaken annually by the Fish and Wildlife Division, with numerous lakes and streams receiving hatchery-raised trout. Stocking occurs only after a standard biological assessment has been done on the receiving waters to determine whether stocking is feasible. The objective is to provide a recreation fishery based on a widespread, self-sustaining fishery supplemented by stocking where required.

Sportfishing is popular in the Coal Branch, and the fisheries resource attracts many visitors. However, as a result of this area's proximity to Edmonton, Edson and Hinton, the fishing pressure is greater than the naturally reproducing fish stocks can support.

Objectives

1. To optimize the abundance, distribution, diversity and recreational use opportunities of the fisheries resource for present and future generations.

2. To identify, maintain and enhance native fish populations in lakes and streams.

3. To protect sensitive populations from the impact of over-exploitation by anglers.

4. To protect fish habitat from excessive degradation by conflicting resource uses.

5. To establish new fish populations in suitable locations as demand warrants.

6. To coordinate fisheries and recreation management plans for lakes to ensure the retention of environmental and aesthetic qualities.

7. To support and assist non-government organizations with fisheries protection and enhancement.

8. To maintain current bull trout populations and expand species distribution and abundance. To identify critical habitat areas, minimize environmental degradation by conflicting resource uses and overexploitation by anglers, and maintain migration corridors to allow unimpeded passage.

9. To increase current Arctic grayling population levels through habitat protection, control of angler harvests and protection of migratory corridors, and to expand current distribution to lakes with suitable habitat through a fish stocking program.

10. To protect critical rainbow trout habitat areas and maintain or enhance naturally reproducing populations in streams and rivers, and to maintain and enhance angling opportunities through stocking in lakes.

11. To maintain current mountain whitefish population levels and protect critical spawning habitats and migration corridors.

12. To maintain current naturally reproducing populations of brook trout and brown trout in lakes and streams. To maintain stocked populations and supplement natural reproduction in lakes where brook trout are currently stocked.

13. To protect and maintain naturally reproducing northern pike and yellow perch populations, protect critical spawning habitat and expand populations to barren lakes that have suitable habitat.

14. To protect and maintain naturally reproducing walleye populations and expand species distribution into suitable habitat.

Guidelines

1. The Fish and Wildlife Division, the Alberta Forest Service (AFS), and the Public Lands Division of the Department of Forestry, Lands and Wildlife, and the Water Resources Management Services of the Department of Environment, will work cooperatively to ensure minimal aquatic impacts from industrial and agricultural developments.

2. Appropriate reservations will be applied around lakes with fisheries potential to ensure their protection for future recreational use.

3. As demand warrants, unsurveyed lakes will be evaluated and developed to optimize the recreational fishery potential.

4. Angling regulations will be reviewed regularly in relation to angler use, harvest levels and the condition of fish populations, to ensure the long-term survival of naturally reproducing resident sport fish populations.

5. Unrestricted legal public access to fisheries will be maintained.

6. Stream fisheries will be managed to maintain the naturally reproducing fisheries populations.

7. Fish stocking will be used primarily where adequate populations of naturally reproducing sport fish are not present.

8. Programs such as access development, Buck for Wildlife, and stocking will be used to maintain and enhance fishing opportunities.

2.8 Recreation and Tourism

The Coal Branch planning area's varied landscape with few settlements is well suited to both intensive and extensive recreation. It offers a backcountry experience to recreation users. The front ranges' scenic landscape, as well as the area's lakes and streams, encourages extensive recreation activities such as hunting, fishing, hiking, equestrian trail riding, off-highway vehicle use and auto-touring. Generally, most recreation users are either local or from the Edmonton area. Use is heaviest on weekends in the summer.

Sportfishing is very popular in the Coal Branch, with overnight camping also being a major recreation activity. The area supports a high level of off-highway vehicle use concentrated in the Mountain Park area with a lower level elsewhere in the Coal Branch. Random camping in association with OHV use

occurs primarily along streams, rivers and some roadways as well as at Mountain Park. There is a moderate level of hiking and equestrian use in the mountains in the western portion of the area. Canoeing is popular on the McLeod and Athabasca rivers. Other rivers receive seasonal use because of their fluctuating water levels which become too shallow as the season progresses (Pembina and Cardinal rivers), or because navigation is too difficult (Brazeau River). Kayaking occurs on the Brazeau River, however.

Winter recreation use is lower than summer use in the Coal Branch. Cross-country skiing occurs primarily near Hinton and Edson where facilities and trails have been developed. Little backcountry skiing occurs in other areas, although skiers do like to use Whitehorse Creek Valley. Snowmobiling is dispersed throughout the area and snowmobilers stage out of the general Robb area for day trips. Snowmobiling, in association with ice fishing, also occurs.

The majority of existing tourist-related facility developments are currently located within the communities. Hinton and Edson are regional service centres that provide many tourist facilities and services such as accommodation, food and retail outlets, municipal recreation facilities and parks, and transportation services. Some tourist-related facilities are also available in Robb and Cadomin. Most campground development is associated with public recreation areas. Some commercial facility developments, such as private sector campgrounds and fixed roof accommodations, are located along the nationally designated Yellowhead (Highway 16).

As previously discussed, outdoor recreation is a major reason for tourists using the Coal Branch today, particularly for sport-fishing and hunting. Other activities that make it attractive for visitors include summer off-highway vehicle (OHV) use, camping, hiking, equestrian use and winter snowmobiling. Wildlife and scenic viewing are also popular activities. The western portion of the planning area is particularly attractive to visitors because of its high aesthetic qualities.

Visitors to the Coal Branch also participate in auto touring activities such as scenic viewing. Many excellent views of the mountains and other scenic landscapes are available when travelling through the region. For example, the seasonal Grave Flats Roadway along the Cardinal Divide provides excellent views. In association with auto touring, the historical aspects of the region (e.g., settlement based on transportation, coal and forestry operations), existing industries that are in evidence, and the natural resources themselves also provide interpretive opportunities for visitors to learn about the Coal Branch. In addition, local organizations and communities host many events that serve to attract visitors (e.g., cultural and sports events).

A preliminary profile of out-of-province visitors to the Evergreen Tourist Zone, in which the Coal Branch lies, indicates that the significant activities in which visitors participated while in Alberta included: sightseeing, visiting friends and relatives, museums and historical sites, photography, camping, hiking and backpacking (1982 Alberta Travel Survey). The profile also identifies private vehicles as the major mode of transportation, with a significant proportion of travel occurring in the summer season.

Information available on Albertans visiting the Evergreen Zone as their main destination, shows that approximately two-thirds of their travel occurred on weekends, with a significant proportion of visitors originating from the Edmonton area (1986 Canadian Travel Survey).

The tourism resources and resulting activities that attract people to the area, plus the strategic location and easy access into and through the region, provide opportunities for potential growth of the tourism industry within the Coal Branch. A significant volume of traffic, both recreational and commercial, uses the Yellowhead Highway. Opportunities may exist to divert and detain this travelling market and encourage further use of the Coal Branch. Tourism-related developments, activities and services that are based on the region's resources should be considered. These could be enhanced through such themes as outdoor recreation, and historical, industrial and natural landscape and wildlife viewing. As recreation use increases in the Coal Branch, private sector opportunities such as lodge and campground development, family vacation destination resort development, trail riding, river operations and guided tours may become more viable. Other

tourism opportunities that are oriented towards interpretive activities (e.g., auto touring, roadside pull-offs, industrial and historical tours, etc.) could also enhance the tourism experience of the Coal Branch. It is anticipated that commercial developments will occur in response to market demand.

The natural resources of the Coal Branch will continue to be important tourism resources in further developing the industry. It is recognized, however, that some recreation and tourism developments and activities may not be compatible with one another (e.g., motorized and non-motorized recreation), or with other resource activities. These other activities, while providing interpretive opportunities, can also have an impact on tourism opportunities (e.g., impacts on aesthetic qualities may occur).

The local governments and the regional planning commission have been examining the region's tourism potential as one means of diversifying and strengthening its resource-based economy. They are committed to further developing this potential. Private sector, local governments, the regional planning commission and other interest groups can become involved in the development of tourism opportunities.

Objectives

1. To provide and maintain public facilities for intensive recreation activities such as auto access camping, group camping, water access points and day use activities.

2. To provide and maintain trails and associated support facilities for extensive recreation activities such as hiking, equestrian use, cross-country skiing, snowmobiling, off-highway vehicle use and water-based recreation.

3. To maintain the recreational capability of areas identified as having a high present recreation value or potential for future recreation/tourism development or use.

4. To maintain the visual quality upon which much of the planning area's recreation and tourism depends.

5. To provide an adequate land base for tourism opportunities in terms of both quantity and quality.

6. To develop the tourism potential of the area and increase visitation by encouraging the provision of a wide variety of tourism opportunities and services.

7. To encourage the development of commercial tourism and recreation facilities and services by the private sector, especially those capable of operating on a year-round basis, on private and/or public land.

8. To provide opportunities for access and base camps for commercial river recreation.

9. To maintain or increase opportunities for recreational use of fisheries and wildlife resources.

10. To encourage the development of tourism opportunities that relate to interpretation of the historical, industrial and natural resources.

Guidelines

1. Public recreation developments for the Alberta Forest Service will be based on their Five-Year Recreation Plan, which is consistent with the management direction identified by this integrated resource plan.

2. The maintenance and upgrading of existing Alberta Forest Service recreational facilities will continue within the scope of recreational operations and maintenance plans.

3. Protection will be ensured for those areas identified as having a high recreation value.

4. The various provincial agencies providing public recreation programs will be encouraged to coordinate their efforts.

5. Fisheries and recreation management plans will be coordinated for all lakes

to ensure the retention of environmental and aesthetic qualities, while maintaining the recreational fishery potential in lakes with a high recreation value.

6. Private sector developments complementary to public sector recreation development will be encouraged.

7. Tourism opportunities will be encouraged. The provision of support services and facilities necessary to stimulate travel in, and use of, the area will also be encouraged. Examination of physical and financial feasibility should be undertaken before development. Other recreation and tourism proposals not specifically identified in the plan will be considered on a case-by-case basis.

8. Consultation and advice is available from the Department of Tourism, the Department of Recreation and Parks, and the Forest Industry Development Division of the Department of Forestry, Lands and Wildlife, to assist existing and potential operators of commercial tourism facilities and services, as well as local communities and organizations interested in expanding the region's tourism industry. Market and demand information will also be supplied where possible. Advice and assistance is available through the Historical Service Division of Alberta Culture and Multiculturalism regarding the preservation and commemoration of historical resources in the region.

9. Opportunities may exist for the development of commercial backcountry lodges in the Zone 4 (general recreation) and the Zone 5 (multiple use) areas. Backcountry lodges can serve as useful staging areas for dispersed recreation activities such as hiking, equestrian use, OHV touring and cross-country skiing. Aesthetic qualities and other natural resource features will be important considerations in possible site identification.

10. The resulting impacts on the environment from tourism developments will be minimized through:

    - grouping tourism facilities and services where feasible while recognizing the need for unique site and scenic requirements of particular types of facilities;
    - ensuring the careful design of facilities; and
    - encouraging environmentally conscious operation of facilities and services after completion.

11. The local governments and non-profit and community organizations will be encouraged to participate in providing recreation and tourism opportunities.

12. Recreation and tourism facility development proposals will be considered in FMA areas, subject to compatibility with timber management and other resource activities. Consideration of areas of high recreation and tourism development potential within FMAs will require coordination with resource management agencies early in the planning stages.

2.9 Historical Resources

Archaeological - From an archaeological perspective, the planning area was comparatively unknown until the 1970s, at which time archaeological investigations of a number of road alignments and proposed coal-mine developments were undertaken. As a result of these studies, some 125 historical resource sites have been identified and the area is considered to have high potential for the discovery of additional sites. In particular, site concentrations have been identified along the Lovett and Embarras rivers in the central portion of the planning area. Similar areas along other streams and river valleys, as well as ridges between drainage systems and linear features adjacent to muskeg elsewhere in the planning area, are all considered to have high

potential for the discovery of historical resource sites.

Palaeontological - Dinosaur bones have been found throughout the region in the upper Cretaceous formations. The stumps of fossilized trees, presumably Palaeocene in age, are found frequently along stream courses. Several important fossil fish sites have been found in the Palaeocene rocks in the planning area, and the potential for large, well-preserved plant fossils is excellent in both the Cretaceous and Palaeocene rocks. Most observable palaeontological sites will be discovered along streams and river courses, along steep faces and the tops of many of the ridges, and in situations where bedrock exposure offers opportunities to find them.

Palaeoenvironmental - Because of its glacial history and position with respect to a presumed "Ice Free Corridor", the Coal Branch area has a high potential for providing long, detailed records of palaeoenvironmental conditions. These records may be obtained by techniques such as pollen analysis of sediments and deposits accumulated in waterlogged sites such as lakes and bogs. However, sites with large and continuous records of environmental change are probably comparatively rare and thus should have a high priority for scientific investigation when identified. In addition, detailed records of environmental change, specifically climatic change, can be obtained from analysis of the growth pattern and characteristics of tree rings. Such studies may provide information on temperature patterns extending several hundred years beyond the instrumental record. This information may be valuable for long-term planning for climatic change, water resources, etc. Prime sites for this type of research occur where trees are growing under stress and are therefore "sensitive", i.e., acting as a climatic signal. These sites would occur primarily at the upper treeline within the area. Because of the fragility and vulnerability of trees in such sites, high priority should be given to the scientific investigation of old (greater than 200 years) stands of trees at treelines.

Historic Period - Staff from the Geological Survey of Canada and independent prospectors first began to investigate the Coal Branch region of Alberta in the mid-1880s. Exploration activity increased around 1907 when the Jasper Park boundaries were marked. By the end of that decade, several coal discoveries had been made within the district, although few, if any, claims had actually been established. It was not until 1911, with the completion of the Grand Trunk Pacific line to Jasper and the construction of spur lines to Lovett and Mountain Park in 1912, that the area was opened up for extensive development. A series of private mining companies then undertook exploitation of the coal reserves, including Pacific Pass Coal Fields Limited, McLeod Collieries Limited, Yellowhead Pass Coal and Coke Company, etc. The coal-mines within the region generally remained active until the mid-1950s when the railway companies ceased using coal as a source of power. Several logging camps were also established within the region in support of both the railway and the coal-mining operations.

Objectives

1. To protect and/or preserve historic resources (archaeological, palaeontological, historical and natural), as defined in the Historical Resources Act, from potential or actual impact related to future resource developments, and to conserve these resources for future generations.

2. To manage historical resources sites for scientific, educational and interpretive purposes.

Guidelines

1. Resource uses in the planning area involving surface disturbance may require Historical Resources Impact Assessments before development occurs, as outlined under Section 33(2) of the Historical Resources Act.

2. The Archaeological Survey of Alberta will participate in the land use referral process, to review proposed development projects within those areas of the Coal Branch considered to be of high historical resource potential.

3. To facilitate this referral process, the Department of Culture and

Multiculturalism will develop a historical resources sensitivity map for the planning area, which will outline areas of historical resources potential for which the Department of Culture and Multiculturalism requests referral of proposed development projects. This map is to be distributed to other government agencies involved in land management for their reference during the course of the internal referral systems of the provincial government (Alberta, 1989).

4. The Department of Culture and Multiculturalism will identify specific types of development projects to be referred at the implementation stage of this plan.

5. Historical resources sites considered to be of provincial significance will be protected and preserved for future generations through the Historical Resources Act.

6. Timber stands that are 200 years and older within the Alpine-Subalpine Ecotone (upper and lower treeline) throughout the planning area may supply significant information on the palaeoenvironmental history of the region. The Alberta Forest Service of the Department of Forestry, Lands and Wildlife will refer sanitation projects within the ecotone to the Archaeological Survey of Alberta of the Department of Culture and Multiculturalism, to ensure scientific investigations (e.g., core sampling) can be conducted before the removal of insect-infested or diseased timber.

2.10 Ecological Resources

Ecological resources are unique or representative ecological features or systems that have been, or may be, identified within the planning area. Ecological Reserves are designated to protect representative and unique landscapes of the province. Wilderness areas are given maximum protection against disturbance by humans. These areas are established by statute to preserve their unique beauty and natural character. Natural Areas have a broader set of uses than Ecological Reserves or Wilderness Areas, including recreation, education and conservation. The main objective of Natural Areas is to maintain the natural characteristics of the sites. Since they are intended for low levels of public use, there are no commitments to develop facilities. Also, the public can participate in the management of these areas.

The Natural Areas and Ecological Reserves programs fall under the Wilderness Areas, Ecological Reserves and Natural Areas Act. There are six sites of interest in the Coal Branch planning area. They are the Cadomin Cave, Muskiki Lake, Grave Flats, Edson South (locally known as Willmore Park), Edson West, Tripoli Ridge (which is part of the Cardinal Divide area) and Marshybank. The latter is established by order-in-council as the Marshybank Ecological Reserve.

Objectives

1. To protect representative and unique examples of the natural features, landscapes and ecosystems of the foothills and Rocky Mountain natural regions of Alberta.

2. To provide for the scientific, recreational and educational use of ecological resources while ensuring their features are maintained in a natural state.

Guideline

1. Appropriate land use reservations or notations will be maintained to protect ecological resources.

2.11 Agricultural Resources

Agricultural development, including improved grazing, forage or crop production, occurs on private land located near Edson. It occurs primarily within the planning area's two townships in the White Area. The demand for more agricultural land will likely increase as the population increases.

Objective

1. Where compatible with other resource uses, to maintain and expand the permanent agricultural land base.

Guideline

1. Land identified as Zone 6 (Agriculture) may be made available for agricultural development, including improved grazing, forage or crop production. The identification of these lands will be based on capability, access and coordination with other resource agencies.

2.12 Rangeland

Domestic livestock grazing occurs primarily in the northeastern corner of the Coal Branch. Within the White Area, there is a total of 14 grazing leases and permits that cover 2360 ha (5832 ac.). They provide 1403 animal unit months (AUMs) of livestock grazing. A portion of the Sang Lake provincial grazing reserve is the primary improved livestock grazing area within the Green Area of the Coal Branch.

Overall, the demand for more grazing lands relates to recreational horse use. There is an increasing interest for more land to serve as horse-holding areas as well as grazing areas for horses. This interest is increasing as the communities grow. Some unauthorized grazing is occurring within the Coal Branch.

Objectives

1. To maintain the rangeland base in the Coal Branch that is required to provide as a minimum the 1977 carrying capacities on grazing dispositions in the planning area (measured as AUMs), as recognized in the Eastern Slopes Policy.

2. To provide public land as horse-holding areas based on local need, capability and compatibility with other land and resource values and uses.

3. To use temporarily available forage (e.g., cutblocks) depending on local need and compatibility with other land and resource values and uses.

4. To maintain or improve the range condition, and forage production and use of grazing dispositions, in recognition of local need, capability for improvement and compatibility with other resource values and uses.

Guidelines

1. Forage resources will follow range management plans that specify the management and potential range improvement requirements. The plans will also specify how to integrate livestock grazing with other land resources and uses.

2. Grazing permits will be available on a temporary basis for specific forage locations (e.g., cutblocks).

3. Encourage range improvements on grazing dispositions (i.e., pasture development, fence and trail construction, etc.) in order to maintain and/or improve range condition, forage production and livestock distribution.

4. Authorized horse use of the forage resources will be managed through appropriate management practices, and uncontrolled horse use will be monitored.

5. All range management plans will be consistent with the management identified through this integrated resource plan.

6. The issuance of grazing dispositions other than grazing leases will be encouraged where there is a need for public access.

2.13 Settlement

Large communities within the Coal Branch are Hinton (pop. 8900) and Edson (pop. 7110). The smaller hamlets of Robb (pop. 230) and Cadomin (pop. 115) are located near the coal-mines. Another hamlet, Marlboro (pop. 200), is located along the

Yellowhead Highway. There is an interest for more seasonal residency to occur in the hamlets. Small Boys Camp, an unauthorized Treaty Indian encampment, is located in the southern portion of the planning area along the Grave Flats road. The Alberta Government will allow this unauthorized use to continue, providing it is recognized as being unauthorized and of a temporary nature only. The Department of Forestry, Lands and Wildlife does not recognize any form of land tenure or right of occupancy at this time, and none will be given.

The major employers in Hinton are the coal-mining and forest industries. In Edson, major employers include the agricultural, minerals (coal, oil and gas) and forest industries, as well as the provincial government's regional services centre. The current policy for settlement discourages the establishment of new towns in the Coal Branch. However, there is pressure for settlement closer to resource developments; this pressure is expected to continue.

Objectives

1. To allow for the expansion of residential uses where the municipality has authorized provision of the necessary infrastructure.

2. To maintain the existing hamlet boundaries, and expand the boundaries only when a need is identified by the Improvement District of Yellowhead, No. 14.

3. To ensure compatibility with the policies of the Yellowhead Regional Plan, the Improvement District of Yellowhead, No. 14's General Municipal Plan and Land Use Order, as well as any other statutory plans and bylaws administered under the Planning Act.

Guidelines

1. The establishment of new settlements, resulting from additional resource developments, that require communal water and sewer systems and new infrastructure will be discouraged; any population growth will be accommodated within existing communities that have the necessary capacity and physical infrastructure.

2. Planning and development on public land will be coordinated through consultation with the Improvement District of Yellowhead, No. 14, the towns of Edson and Hinton, and the Yellowhead Regional Planning Commission; guidelines will be provided through the statutory plans, land use orders and bylaws, and this document.

2.14 Access

The Yellowhead Highway is a national transportation route that provides access to the west coast through the Rocky Mountains. Other primary highways within the Coal Branch include highways 40 and 47. There is also a large number of resource roads that have been established in association with the forestry and oil and gas industries. The main line of the Canadian National Railway follows the Yellowhead Corridor. A branch line (the Coal Branch) extends from near Bickerdike to Coal Valley, Hanlan, the Cardinal River and Gregg River coal-mines near Cadomin. Airports are located near the communities of Edson and Hinton.

Heavy recreational off-highway vehicle use has had adverse impacts in certain areas. It can damage terrain and reduce water quality as a result of erosion, thus also affecting the fisheries resource. In addition, it can also have an impact on use of the range by wildlife.

Objectives

1. To coordinate the development of access and rights-of-way in order to minimize adverse effects on other resources and minimize cost and duplication of effort.

2. To achieve mobility of people and goods by ensuring access to transportation systems that contribute to economic growth and are safe, dependable, effective, efficient and environmentally compatible.

3. To meet the required safety standards and free-flow design of the primary highway system through access control.

4. To meet provincial and regional transportation needs recognizing multiple use requirements such as settlement access, industrial access, recreation access and inter-regional access.

Guidelines

1. Resource users will be encouraged (preferably before application) to use common access corridors to minimize environmental impacts and duplication of effort and expense.

2. Access planning must consider all resource users including recreational users.

3.0 RESOURCE MANAGEMENT AREAS

The Coal Branch planning area was divided into the following eight smaller resource management areas (RMAs) to facilitate the geographic location of resource management objectives (Figure 3).

A. Yellowhead Corridor
B. Edson South-Pembina
C. Robb Highlands
D. Cardinal-Brazeau
E. McLeod
F. Brule Lake
G. Mountain Park-Folding Mountain
H. Nikanassin

The balance of this report discusses the eight RMAs. Each RMA is identified by:

- a general description of the RMA;
- a specific management intent;
- specific resource management objectives and guidelines by resource sectors; and
- a brief description of each resource sector. The refined Eastern Slopes zoning is also identified.

The broad resource management objectives and guidelines stated in Section 2.0 apply to each resource management area. Only resource management sectors with more detailed or specific objectives and guidelines are listed. The objectives provide a concise statement of a desirable state for a resource or resource use. The guidelines describe how the objectives will be achieved. It is recognized that conflicts between specific resource management objectives may exist, so resource management guidelines assist in integrating objectives and minimizing conflict.

3.1 Yellowhead Corridor Resource Management Area

The Yellowhead Corridor Resource Management Area is an area of approximately 1029 km^2 (397 sq. mi.) forming the northern boundary of the Coal Branch planning area (Figure 4). It includes the Yellowhead Highway.

The topography varies from moderately to gently rolling in the west, to very gently rolling and hummocky in the east.

The RMA represents mainly the Boreal Foothills Ecoregion. Forest cover consists of lodgepole pine, white spruce and aspen. More specifically, white spruce is the successional climax species on well-drained to moderately drained upland sites. Both white and black spruce are potential climax species on imperfectly drained sites, while black spruce and tamarack have the potential to form the climax species in poorly drained, depressional areas. Pine and aspen are the major species of most forest stands in this ecoregion because of past fire history and warm, moist conditions during the growing season.

A small western portion of the Athabasca Valley is within the Montane Ecoregion. Its vegetative patterns are dominated by white spruce, aspen and grasslands. The very dry sites are characterized by patterns of aspen and grasslands. Increased moisture allows aspen, balsam poplar and white spruce to form mixed stands. The climate is characterized by intermittent snow cover and warm winter temperatures. This is due to the warm Pacific air (chinooks) moving down the valleys in the Rocky Mountains. In the summer, precipitation and temperatures are higher than in the other ecoregions of the Coal Branch.

The balance of this section consists of a statement of intent for resource management within the RMA, plus a set of objectives and guidelines for each resource sector. A resource summary is also provided for each resource sector.

The management intent for the Yellowhead Corridor RMA is to provide for a range of extensive and intensive recreation and tourism opportunities within a multiple land use context, and to recognize the development needs of existing communities.

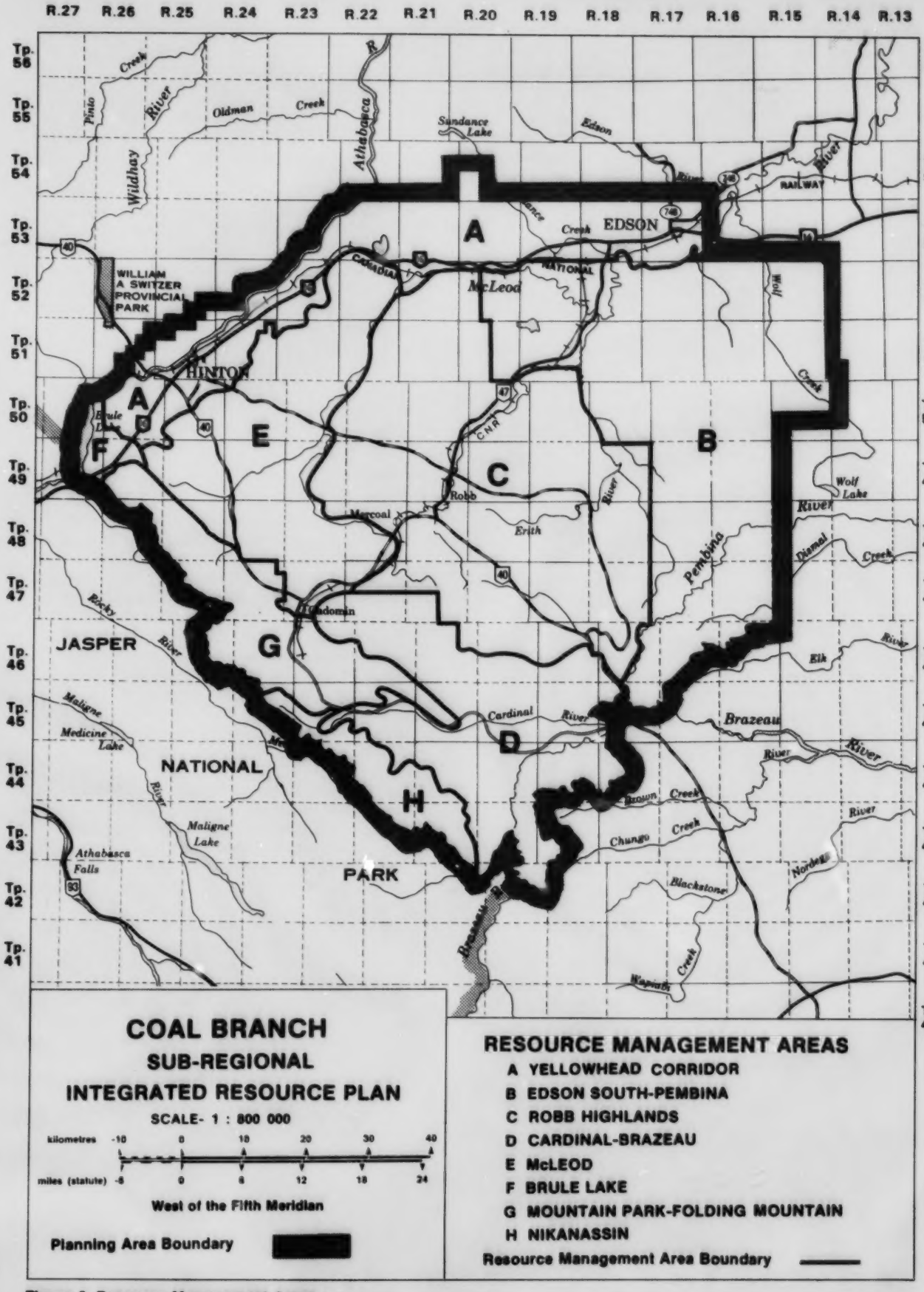

Figure 3: Resource Management Areas.

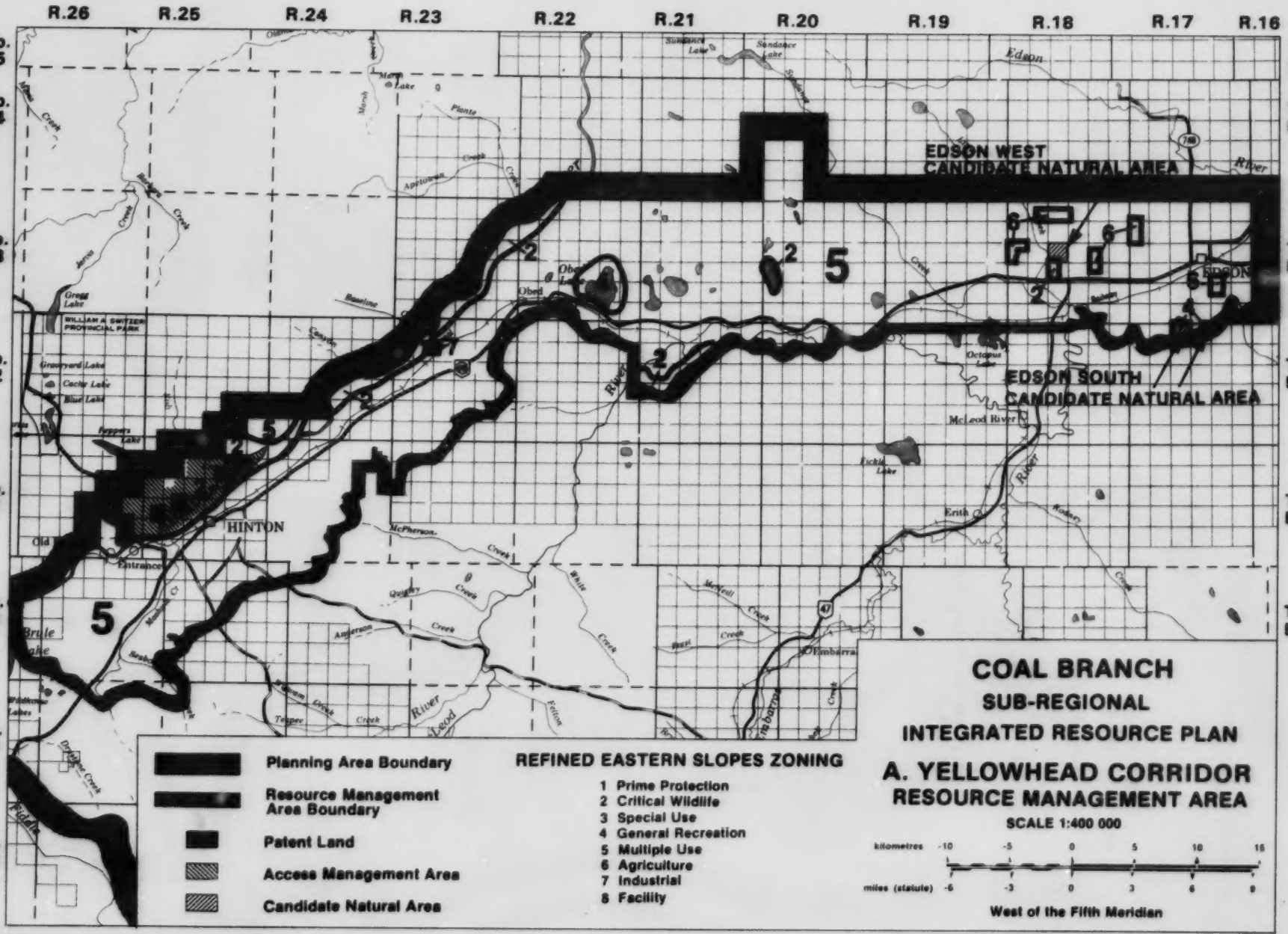

Figure 4: Yellowhead Corridor Resource Management Area.

In response to the various public interests for the recreation and tourism resources and other resources, a local integrated resource plan is recommended for the Yellowhead Corridor.

Water and Watershed

Parts of the Athabasca and McLeod rivers are in this RMA. The water supplied by these two rivers is important for both on-site and downstream industrial and municipal needs. The smaller drainages have a wide diversity in erodability, hydraulics and water quality and quantity.

The soils vary from silty sands and glacial tills in the east on fairly level topography, to coarser sands and tills on rolling topography in the west. These soils are subject to moderate erosion.

The western portion of the RMA within the Montane Ecoregion contains eolian deposits (generally silty sands) which, when combined with the relatively arid and windy climate, make the soils prone to wind erosion when vegetation is removed or disturbed. Vegetation is also difficult to re-establish after disturbance because of the climatic and soil conditions.

Although portions of the Yellowhead Corridor have been developed extensively, the impact on water quality and quantity has been limited.

Objectives

1. To maintain an optimal level of water quality and adequate volumes of water within the context of regional water management objectives.

2. To minimize erosion and soil losses resulting from land use activity.

Guidelines

1. Sites with sensitive soils or vegetation will require intensive planning and closely supervised development (site-specific planning along the Athabasca and McLeod riverbanks).

2. There is an Athabasca River Basin Plan in preparation by Alberta Environment, that will contain specific objectives (for water quality and quantity) that take into account industrial and municipal needs.

Minerals

Most of the area is underlain by coal-bearing strata. Coal exploration data have supported the designation of the Cold Creek deposit (which has remaining reserves of six megatonnes) of the Coalspur coal field, part of the McLeod River North deposit (remaining reserves of 230 megatonnes) and the isolated deposit at Maxwell Lake. Part of the Obed Mountain mine permit area (containing conveyor and coal loading facility) extends into this corridor RMA. Portions of three coal exploration project areas extend into the corridor.

Six natural gas and/or oil fields and five gas processing plants are located here. Two of the fields (Galloway and Dalehurst) are mostly within the RMA. The Edson field, which extends over a very large area, has reserves of both oil and gas. The Obed field has reserves of sulphur in the form of hydrogen sulphide (sour gas). The main oil pipeline from northern Alberta to British Columbia crosses the Yellowhead Corridor.

Objectives

1. To provide opportunities for continued exploration and development of important petroleum and natural gas resources.

2. To provide opportunities for coal exploration and development.

3. To allow for the continued development of coal resources throughout the area by making use of the infrastructure.

Guideline

1. All mineral resource-related developments must plan for the avoidance or mitigation of impacts on urban areas and on watershed, recrea-

tion, tourism, aesthetic, wildlife and fisheries values.Mineral development projects will follow the existing approval processes.

Timber

This RMA contains portions of the E2, EO1 and E4N FMUs and all of the E9 FMU (Appendix B). The E2 FMU contains one coniferous timber quota, one deciduous timber allocation (DTA) and four miscellaneous timber use areas (three coniferous - one deciduous). E4N is held by Weldwood of Canada Ltd. under their Forest Management Agreement. Reforestation problems have been experienced in that portion of the forest management unit that is within the Montane Ecoregion (west of Hinton). This has been due to the dry, eolian soils. The progressive reforestation approach now used has enabled the majority of the area to be restocked satisfactorily. E9 is managed as a miscellaneous timber use area for the residents of the Hinton area. H1 (Cache Percotte Forest) is maintained as a teaching and research forest. It also offers other resource development opportunities (including timber, grazing, recreation, wildlife and fisheries) managed under a multiple land use context.

Objectives

1. To ensure that Weldwood of Canada Ltd. manages that portion of their FMA in the Forest Management Unit E4N to provide a sustained yield of coniferous timber.

2. To manage E9 to provide a sustained yield of timber for local timber operators and public use.

3. To manage E2 to provide a sustained yield of timber for DTA holders, local timber operators and public use.

4. To manage some of the public land in E01 to provide a sustained yield of timber for local timber operators and public use.

5. To ensure that the integrity of the Cache Percotte Forest (H1) is maintained for educational and research purposes within the multiple use management concept (e.g., minerals, timber, range, watershed, wildlife, fisheries and recreation resources).

6. To coordinate use of deciduous and coniferous resources on lands designated for mineral and agricultural development.

Guidelines

1. The forest management plan for Weldwood of Canada Ltd. will be followed to manage the timber resource.

2. The management of the timber resource in the Green Area outside the FMA will follow the forest management unit plans.

3. The Timber Harvest Planning and Operating Ground Rules (Alberta, 1986a) will apply.

4. Timber harvesting within the line of sight of Highway 16 and the McLeod and Athabasca rivers will be planned according to the Forest Landscape Management Strategies for Alberta (Alberta, 1988c).

5. Where timber values and demand indicate, the management will be sustained yield in the White Area.

Wildlife

The Athabasca and McLeod river valleys contain a good mixture of coniferous and deciduous forests, and meadows that provide valuable habitat for elk, moose and deer. The Athabasca Ranch Buck for Wildlife Area (north of Hinton) was designated in 1978. Its purpose is to maintain and improve elk habitat by maintaining existing meadows and improving forage production in the Athabasca River valley. The small lakes between Obed and Edson provide nesting habitat for trumpeter swans, a "threatened" species.

Disturbance of swans in their nesting habitat may result in nest abandonment.

Objectives

1. To increase the elk population from 40 to 80 animals outside Zone 2 areas. Moose populations will be managed to retain present densities of 0.3/km^2 outside Zone 2 areas.

2. To increase the elk population from 20 to 60 animals and maintain moose densities of at least 0.6/km^2 in the Athabasca River Zone 2.

3. To increase the elk population from 40 to 100 animals in the Athabasca Ranch Buck for Wildlife Zone 2.

4. To maintain moose densities at 0.8/km^2 and increase the elk population from 6 to 15 animals in the McLeod River Zone 2.

5. To maximize the number of successfully nesting pairs of trumpeter swans.

6. To protect a small area of public land west of Edson in a Zone 2 as an important deer overwintering habitat.

Guidelines

1. This plan will result in the recognition of a seasonal access management area (AMA) on part of the Athabasca Ranch Buck for Wildlife Zone 2 area. In this AMA, motorized recreation vehicles will be restricted annually from September 1 to April 30. A bow-hunting season is proposed in the AMA.

2. Escaped/abandoned horses will be controlled to limit competition with elk.

3. Crop depredation in the Edson, Marlboro, Obed and Hinton areas will be minimized through policies that encourage landowners to stack feed close to their residences, and by installing fencing and intercept feeding equipment provided by the Fish and Wildlife Division of Forestry, Lands and Wildlife.

4. All known trumpeter swan nesting ponds will be protected through boating prohibitions and protective reservations surrounding the water-body.

5. Ponds identified as suitable for trumpeter swan habitation, but which lack nesting sites, will be enhanced through placement of artificial nesting platforms.

6. Reservations will be placed to protect important wildlife habitat, where required.

7. Wildlife habitat will be retained as public land within the White Area and Green/White Area fringe.

8. A mule deer and white-tailed deer key wintering area located west of Edson in a Zone 2 will be protected.

9. Sucker Lake will be managed as a Zone 2 to maximize the number of trumpeter swan nesting pairs.

Fisheries

Several lakes in the RMA support productive fisheries. Rainbow trout are stocked annually in Lamberts Pond, Millers Lake, Eccles Pond and Pedley Reservoir. These water bodies are heavily used and provide an important recreational fishery in the area. Obed Lake provides a quality rainbow trout and brown trout fishery. Numerous streams in the Athabasca and McLeod drainages produce rainbow trout, brook trout, mountain whitefish, brown trout, Arctic grayling and northern pike. Fishing pressure varies from low to high. Areas of high fishing pressure result from high levels of access.

Objectives

1. To produce numerous small fish and enable the public to catch their limit in

a half day (a catch rate of 0.5 fish per angler) in several highly productive lake fisheries.

2. To maintain Obed Lake as a quality rainbow trout and brown trout fishery (i.e., larger fish as opposed to many fish).

3. To maintain quality fish habitat in the numerous drainage streams of the Athabasca and McLeod rivers.

4. To retain public access to streams, rivers and lakes important as recreational fisheries.

Guidelines

1. Annual stocking of several lakes will continue in order to provide a good recreational fishery.

2. Public land adjacent to important rivers and lakes will be retained in public ownership in order to provide public access and streambank protection.

Recreation and Tourism

The Yellowhead Corridor RMA includes most of the Highway 16 route that is within the planning area. The Yellowhead Highway is recognized nationally and serves as a major auto touring route into and through the region. Obed Summit, which is the highest elevation along the entire Yellowhead Highway, is located in this RMA. Because of the high volume of leisure traffic along the route, potential exists to further develop tourist services and facilities that cater to this market (e.g., serviced campgrounds, lodge development, scenic/interpretive pull-off areas).

The corridor receives a high level of day use recreation, with fishing being a popular activity. The Alberta Forest Service operates two recreation areas within the RMA, Obed Lake Campground and Eccles Pond Day Use Site, with a combined capacity of 12 campsites and 22 day use sites. Some consideration may be given to closing the Obed Lake Campground because of budget constraints. The Department of Transportation and Utilities operates Hornbeck Creek and Roundcroft campgrounds. The Fish and Wildlife Division operates Millers Lake and Lambert's Pond day use areas. The Bighorn Trail, running from Hinton south to the Gregg River, is administered by Weldwood of Canada Ltd. The trail originates in this RMA and supports extensive hiking/equestrian use in the summer and some cross-country skiing in the winter. Willmore Park (Zone 4) south of Edson and along the terraces of the McLeod River, is managed by the town of Edson under a recreation lease. It represents an excellent 102 ha (252 ac.) recreation area that supports a diversity of upland forest cover (including aspen and balsam poplar, lodgepole pine and white spruce). A campground and biathlon trails are situated in this natural setting. Other areas used by local recreationists include the Little Sundance Creek for extensive recreation activities, and the Athabasca Ranch public land area for both motorized and non-motorized recreation.

Hinton and Edson provide a variety of tourist services and facilities. Both communities are adjacent to primary highways 40 and 47 which provide access to the southern portion of the Coal Branch. Potential exists to expand their role as regional tourist centres.

The Athabasca River provides good water-based recreation opportunities. The reach within this RMA is rated as Class I (easy) and II (medium difficult) for canoeing. Maintaining recreational access to both the Athabasca and McLeod rivers is important since they offer a high potential for additional use.

Objectives

1. To maintain the recreational capability of specific areas (Obed Lake/Zone 4) and to protect river corridors (Athabasca and McLeod rivers), identified as having a high recreation potential or present use.

2. To recognize the touring opportunities along Highway 16 and the potential for associated facility development.

3. To encourage the maintenance and provision of commercial tourism facilities and services in Edson and Hinton, and along the Yellowhead Highway for recreational users and the travelling public.

4. To protect the visual landscape qualities along highways 16, 40 and 47 (i.e., line of sight).

5. To provide opportunities for commercial tourism developments (e.g., campgrounds, guest ranches) and associated recreation development.

6. To support existing commercial river operations (Athabasca River) and provide opportunities for additional operations (Athabasca, McLeod rivers).

7. To provide public access points and facilities for water-based recreation.

8. To retain public access to public lands along rivers and lakes.

Guidelines

1. Development of commercial recreation facilities and services will be a high priority.

2. Timber harvesting and other developments within the line of sight of highways 16, 40 and 47, and the McLeod and Athabasca rivers, will be planned to meet aesthetic requirements.

3. Development of scenic viewing and interpretive pull-off areas will be considered within the Highway 16 twinning program. The departments of Tourism and Culture and Multiculturalism, as well as other interested agencies, will assist the Department of Transportation and Utilities in identifying sites along Highway 16 that have potential for development and/or interpretation.

4. Consultation will be available through the Department of Tourism and Forestry, Lands and Wildlife's Forest Industry Development Division to any private sector operator, local governments, non-profit and community organizations interested in providing tourist services and facilities or in developing the region's tourism industry.

5. Dispositions that restrict public access along rivers and major streams will not be issued.

Historical Resources

Archaeological - From a prehistoric archaeological perspective, the Yellowhead Corridor RMA can be divided into two portions: the Athabasca River valley and lands contained within the McLeod River basin. The Athabasca River valley portion contains a very high level of sensitivity for prehistoric resource sites. Surveys conducted along the main river and several of its tributaries have identified a wide range of prehistoric sites. These are located on river and stream terraces and around the shores of small lakes. They consist of buried and surficially exposed materials representing the remains of campsites and specific resource exploitation and production activities. None have been systematically assessed; consequently, at present it is not possible to identify occupation dates or specify site functions for any of these sites. On the basis of finds elsewhere in the region, however, it is assumed that these known sites may date anywhere between the earliest occupation of the area around 11 000-12 000 years ago to about 250 years ago.

The Athabasca River valley provides access to a number of passes leading into the interior valleys of British Columbia (Fraser and Columbia drainages), and is known to have been a major travel and trade corridor historically. The presence of materials and artifacts from British Columbia in a number of local site collections indicates this exchange pattern has great antiquity. Several sites have been recorded along Maskuta Creek. It is expected that additional finds could be made here. The potential for examination of important questions relating to prehistoric

inter-regional exchange exists at known and at as yet unidentified sites.

Major river valleys also serve as a focus for the seasonal movements of game animals. Exploitation of these and other food resources by prehistoric people is undoubtedly a major reason for known site distributions. It is expected that many sites relating to such activities remain to be identified in this area.

An additional aspect to the archaeological sensitivity of this RMA is the potential for the deep burial and stratification of site deposits. The infilling of river terraces by unconsolidated glacial sediments, and the occurrence of considerable eolian deposits within the main valley (particularly near its western end), could have resulted in preserved, geologically stratified cultural deposits at various locations within the valley. Sand dunes, stream terraces and lakeshores are likely locations for such occurrences.

The eastern portion of this RMA is within the McLeod River basin and exhibits quite different characteristics. The river itself begins in the front ranges and does not provide access into British Columbia. As a result, its potential as a travel corridor is limited to local use. Being on the edge of the foothills, the land is more level and contains less incised drainages and greater amounts of wetlands than does the more western portion. Consequently, resources suitable for human exploitation would be more dispersed and typical of the boreal forest. Prehistoric settlement patterns can be expected to reflect these characteristics.

Few archaeological surveys have been conducted here and, as a result, there are fewer known sites. With the exception of a single campsite located on a terrace of the McLeod River, sites have been recorded well back from the main river adjacent to small creeks and wetlands. Both types of locations are typical of the boreal forest. Locations exhibiting potential for site occurrence are river and stream terraces (particularly south-facing ones), the shores of lakes, the perimeters of wetlands, and exposures of materials in bedrock or alluvial gravels suitable for stone tool manufacture.

Palaeontological - This RMA is representative of the foothills physiographic region that yielded fish and dinosaur remains. The foothills contain exposures of Lower to Upper Cretaceous marine and non-marine beds and Paleocene beds (Luscar, Blackstone, Cardium, Brazeau and Paskapoo formations). Exposure of these formations commonly occurs in river valleys, road and railway cuts, abandoned mine sites and along ridges. A number of significant fossil-bearing sites have been recorded in the RMA, and have yielded both dinosaur bones and plant remains. All major developments, such as coal-mining operations and road construction, should be preceded by a palaeontological impact assessment.

Historic Period - Historically, the region was the focus of early coal-mining and forestry activity. Significant coal discoveries in the Coal Branch in 1906 and 1909 signalled the advent of an era of prospecting and the development of a coal extraction industry which was in operation as early as 1911. By 1928, almost 20 private mines and prospecting areas had been opened up in the Coal Branch, along with numerous communities complete with amenities typical of natural resource frontier settlements. The lumbering industry, which began primarily as a supplier of building materials to the mines and railways, expanded after 1912 in response to the need for buildings.

The remains of structures relating to these activities may exist throughout the Yellowhead Corridor RMA, and would be of interest to the Department of Culture and Multiculturalism.

Objective

1. The broad historical management objectives apply.

Guidelines

1. All major developments, such as coal-mining operations and road construction, will be preceded by a palaeontological impact assessment.

2. The Archaeological Survey of Alberta will participate in the land use referral process to review developments proposed in areas of the Yellowhead Corridor RMA considered to have historical resource potential. The historical resources sensitivity map will outline areas of historical resources potential for which the Department of Culture and Multiculturalism will request referral of proposed development projects.

Ecological Resources

The Edson West candidate natural area is located in Sec. 21, Twp. 53, Rge.18, W5M. This 259 ha (640 ac.) site has a protective notation for recreation. The site's topography is undulating, and a creek crosses part of the area. The land supports a diverse upland mixedwood forest with black spruce stands, and willow-sedge grows in some depressions.

Another candidate natural area located within this RMA is the Edson South (Willmore Park) site. A recreation lease has been given to the town of Edson for management of these lands in Sec. 33 (N/River), NE 34 (N/River) of Twp. 52, Rge. 17, W5M. This 165 ha (408 ac.) site has a protective notation for recreation. Noteworthy natural features of the area are the terraces along the McLeod River and diversity in the upland forest cover (includes aspen and balsam poplar, lodgepole pine and white spruce) along the river. The town of Edson's campground with biathlon trails contributes to its recognition as an excellent recreation area.

Objective

1. To provide for scientific, recreational and educational use of the proposed Edson West and Edson South candidate natural areas.

Guideline

1. A protective notation will act as a holding mechanism for the Edson West and Edson South sites until the form of any further protection, such as natural area designation, is approved and established.

Agricultural Resources

Agricultural land use is very limited, occurring mainly on private land within the White Area near Edson. The demand for more agricultural land for cattle grazing and forage production will likely increase as the population increases. Identification of those lands available for agricultural development will be based on capability and access, and will be coordinated with other resource agencies.

Objective

1. To expand, where compatible with other resources, the permanent agricultural land base.

Guideline

1. Lands identified as Zone 6 (Agriculture) may be made available for agricultural development, including improved grazing, forage or crop production.

Rangeland

Domestic livestock grazing occurs primarily on 14 grazing dispositions that cover 2360 ha (5832 ac.) in the White Area. They provide 1403 AUMs of grazing. There are also some semi-improved and unimproved horse-holding areas near Hinton. The interest in grazing lands for both cattle and horses is expected to continue. Some rangelands west of Hinton can be difficult to revegetate because of the area's climatic and soil conditions.

Objectives

1. To provide grazing opportunities to meet local need.

2. To promote private management of horse-holding areas.

Guidelines

1. Range management plans must recognize the need for protective

management of vegetation on eolian soils.

2. Intensified management of the forage resources will be encouraged.

3. The issuance of grazing dispositions other than grazing leases will be encouraged where there is a need for public access.

Settlement

The Coal Branch's two largest communities of Hinton and Edson are located along the Yellowhead Highway. The smaller hamlet of Marlboro is also located along the Yellowhead Highway. Other rural residents of the Improvement District of Yellowhead, No. 14 are located primarily near these communities. They represent the agricultural community, the tourism service industry and the country residential landowners. There is also a general interest for cottage development as well as for other types of seasonal residential developments.

Objectives

1. To maintain public land adjacent to urban settlements for potential urban expansion, where compatible with other resource uses.

2. To encourage country residential and cottage subdivision development in areas where physical infrastructure and/or such land uses already exist.

3. To maintain the present subdivision of Bickerdike and expand only when a need is identified.

4. To provide land for the expansion of Edson, Hinton and Marlboro when a need is identified.

Guideline

1. Coordination between all statutory planning documents and this document will occur through consultation with the Improvement District of Yellowhead, No. 14, the towns of Edson and Hinton, the Yellowhead Regional Planning Commission and the Department of Forestry, Lands and Wildlife. This consultative approach will ensure compatibility of resource uses.

Access

The Yellowhead Highway which crosses this RMA is a national route linking Edmonton to the west coast. It is important for the transport of people and goods. The Department of Transportation and Utilities plans to complete twinning the Yellowhead (from Edmonton to junction of Highway 40) by 1990. Highways 40 and 47 both branch off the Yellowhead Highway.

The Canadian National Railway's main line also crosses this RMA. The Yellowhead Corridor RMA includes a major pipeline corridor for the oil and gas industry. Airports are located near Edson and Hinton.

Motorized recreation use occurs north of Hinton in the Athabasca Ranch Buck for Wildlife public land area. In order to increase the elk population, this plan will result in a seasonal access management area on part of the area. Although motorized recreation use will be prohibited from September 1 to April 30, OHV use to retrieve game will be considered by the appropriate agencies.

Objectives

1. To control access points along the Yellowhead Highway for transport of people and goods.

2. To manage motorized recreation activities on a portion of the Athabasca Ranch Buck for Wildlife public land area.

Guideline

1. A seasonal access management area (Figure 4) will apply to a portion of the Athabasca Ranch public land area. Although this AMA will prohibit motorized recreation use annually from September 1 to April 30, OHV use to

retrieve game will be considered by the appropriate agencies.

3.2 Edson South-Pembina Resource Management Area

The Edson South-Pembina RMA is an area of approximately 2072 km^2 (800 sq. mi.) along the Coal Branch's eastern boundary (Figure 5).

The northern half of the RMA represents the Boreal Foothills Ecoregion, and the southern half of the RMA represents the Boreal Uplands Ecoregion. The Boreal Foothills is distinguished from the Boreal Uplands by the presence of pure and mixed stands of aspen on moderately well-drained to well-drained upland sites. Aspen is generally absent in the Boreal Uplands, but can be found in mixedwood stands on well-drained soils or south-facing slopes. Coniferous forests occur extensively throughout the Boreal Uplands, as well as on moderately well to imperfectly drained sites in the Boreal Foothills. There is a significant amount of wetland in the RMA. These organic deposits are primarily fens. The tree cover varies from dense black spruce in depressional bog deposits to black spruce-tamarack in treed fens, to untreed shrub and sedge-dominated fens. The major physiographic features represented here include mainly the Wolf Lake Uplands, some Edson Plains and a small portion of the Cynthia Upland.

The management intent for the Edson South-Pembina RMA is to provide for a range of multiple use activities while still protecting all resource values.

Water and Watershed

That portion of the McLeod River within this RMA flows through moderately to gently rolling terrain, with extensive poorly drained low-lying areas dominated by organic soils. The Embarras River, a tributary of the McLeod, has characteristics similar to the McLeod. The Erith River, another tributary of the McLeod, flows through gently rolling topography with extensive lacustrine deposits and highly meandering low-gradient streams. The fine bank materials are subject to cutting, and bank slumping is common.

A downstream portion of the Pembina River also flows through this RMA. Here, the Pembina has slower, more meandering channels with high, slumped banks.

Within these drainages, streams are generally slow moving and often flow through extensive poorly drained lowlands and muskeg. The extensive areas of poorly drained soils adjacent to stream channels increases the risk of flooding during major storms. There has also been some over-bank flooding of the Embarras River at and near Robb.

Previous resource development and construction has resulted in a number of erosion problems that have been, or are in the process of, being restored or reclaimed. Reclamation is not difficult due to relatively fertile and deep soils.

Water quality is generally lower than the rest of the Coal Branch due to high organic and sediment levels. Soils are often finer textured (silty sands) and are moderately erosive; however, slopes are rolling and not steep.

Objective

1. To ensure that existing and future resource developments do not result in unacceptable changes in water quality or quantity.

Guideline

1. The existing operating conditions and ground rules for timber harvesting will apply.

Minerals

This entire area is underlain by coal-bearing strata. However, because coal exploration has been limited, coal deposits have been designated only on the margins of the RMA. Small parts of the McLeod River and Coalspur coal fields extend into the area, and

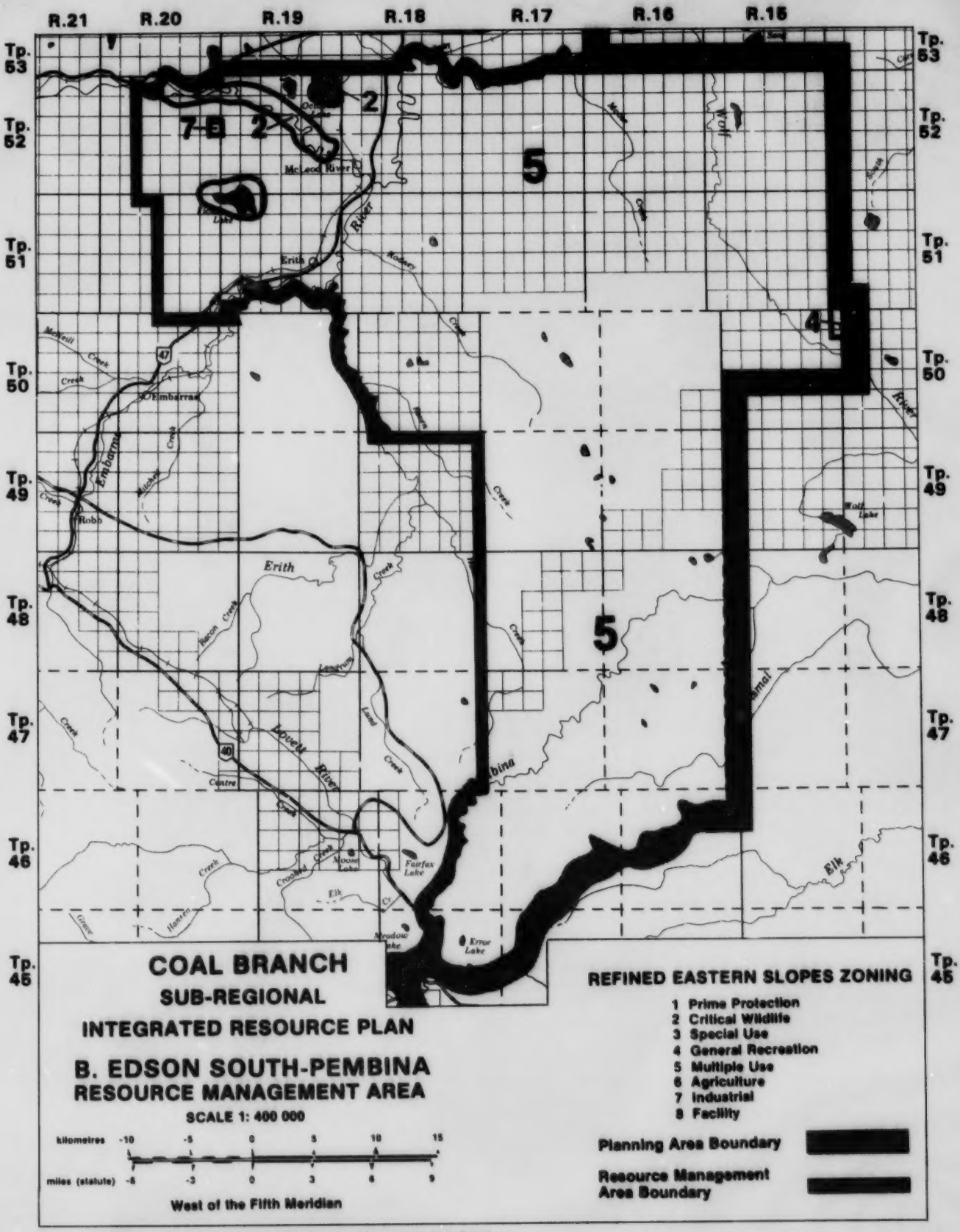

Figure 5: Edson South-Pembina Resource Management Area.

the isolated deposit at Dismal Creek occurs on the planning area's eastern boundary. Much of the potential coal would be located at depths more suited to underground mining with today's technology.

Nine natural gas fields occur partially or entirely within this RMA. Four gas processing plants are also located here. The major portion of the Edson field, including reserves of petroleum, occurs in this area. The Hanlan field contains sulphur reserves (sour gas).

Objectives

1. To provide opportunities for petroleum and natural gas exploration and development.

2. To provide opportunities for coal exploration and development.

Guideline

1. Mineral exploration and development will follow the existing approval processes.

Timber

The RMA includes all of the E1 FMU and the eastern portion of E5 FMU. It contains a quota that forms part of the wood supply for a wood processing facility in the Edson area. The E1 FMU contains six coniferous timber quotas, one deciduous timber allocation and two miscellaneous timber use areas (one coniferous, one deciduous). Deciduous and coniferous annual allowable cuts are fully committed in this FMU. A large quota holder, Sundance Forest Industries Ltd., has a sawmill located within this RMA.

Objectives

1. To provide a continuous supply of coniferous and deciduous timber from the sustained-yield land base for quota and DTA holders, local operators and local use.

2. To maintain and enhance timber yield.

Guidelines

1. Users of the coniferous and deciduous timber in this FMU will be encouraged to cooperate because of the high degree and number of timber commitments.

2. Prompt reforestation and intensive forest management practices will be carried out.

Wildlife

The area in the eastern part of this RMA is primarily poorly drained lowlands. Numerous fens and willow flats, interspersed with coniferous forests and old burn areas, provide good moose habitat. Moose densities are moderate to high throughout. The western part of the RMA includes an important elk and moose overwintering area in the McLeod River valley and valuable ungulate habitat in the mixedwood forests adjacent to Fickle Lake. Several small herds of elk are present in isolated pockets of suitable habitat throughout the area. River otters occur sporadically. Recreational hunting is an important activity in the RMA.

Objectives

1. To increase the elk population from 85 to 250 animals (inside and outside Zone 2).

2. To maintain the moose densities of 0.6/km^2 in the McLeod River Zone 2, and to increase moose densities from 0.3/km^2 to 0.5/km^2 outside Zone 2.

3. To maximize the number of successfully nesting pairs of trumpeter swans.

4. To supplement river otter populations.

Guidelines

1. Escaped/abandoned horses will be controlled to limit competition with elk.

2. Crop depredation in the McLeod River, Bickerdike, Wolf Creek and Sang Lake areas will be minimized through policies that encourage landowners to stack feed close to their residences, and by fencing and intercept feeding equipment being provided by the Fish and Wildlife Division of Forestry, Lands and Wildlife.

3. Cattle grazing in critical elk winter range (Zone 2) in the McLeod River Valley will be managed to maximize forage production for elk.

4. All known trumpeter swan nesting ponds will be protected through boating prohibitions and protective reservations surrounding the water body.

5. Ponds identified as suitable for trumpeter swan habitation, but which lack nesting sites, will be enhanced through placement of artificial nesting platforms.

6. Octopus Lake will be managed as a Zone 2 for trumpeter swan production.

7. River otter will be transplanted into suitable habitat when stock is available.

Fisheries

Lake fisheries are provided in Fickle Lake (northern pike, lake whitefish, walleye, perch) and Jackfish Lake (northern pike). Fickle Lake is a regionally significant recreational fishery. A number of high quality stream and river fisheries are also present in the RMA. The major sport fish produced in these streams are mountain whitefish, rainbow trout, Arctic grayling and northern pike. Fishing pressure is moderate.

Objective

1. To maintain northern pike and lake whitefish populations, and to enhance walleye populations in Fickle Lake.

Guideline

1. Walleye populations in Fickle Lake will be supplemented by stocking.

Recreation and Tourism

This RMA supports a moderate level of recreation activity. Fickle Lake is a popular recreation and tourism destination point for both the local and regional markets. Ice fishing also occurs here. Hunting, fishing and the associated OHV use occur throughout the area. Recreation activities are extensive in nature. The McLeod River supports a moderate level of canoeing with other streams and rivers being generally too small for canoeing. The McLeod provides good water-based opportunities. Snowmobiling occurs at moderate levels in this RMA. Some cross-country skiing also occurs here.

Recreation and tourism developments are currently limited to four AFS recreation areas in this RMA: Fickle Lake Campground (Zone 4), Minnow Lake Group Camp (Zone 4), Lambert Creek Campground and Weald Group Camp. They provide a combined capacity of 51 campsites and 34 day use sites. Highway 47 is the major auto access route through this RMA which serves as a regional recreation route. In looking at the total Coal Branch area, this RMA has limited potential for public recreation development.

Objectives

1. To provide and maintain auto-access camping, group camping, day use facilities and water access opportunities.

2. To provide and maintain trails and associated support facilities for snowmobiling, cross-country skiing and water-based recreation.

3. To maintain the recreational capability of specific areas, including Fickle Lake (Zone 4) and river corridors along the McLeod, Pembina, Erith and Embarras rivers, identified as having a high recreation potential for present or future recreation uses or development.

4. To recognize Highway 47 as the primary focus for auto touring opportunities since it serves as a regional recreation route.

5. To ensure the management of the visual landscape quality along Highway 47 (to line of sight).

6. To provide opportunities for commercial river operations on the McLeod River.

Guideline

1. Developments will be reviewed to minimize any impacts on areas of high recreation value (e.g., Highway 47 and the Embarras and Erith rivers). This will ensure the maintenance of their aesthetic values.

Historical Resources

Archaeological - Very few archaeological studies have taken place within the boundaries of the Edson South-Pembina RMA. Only three prehistoric sites have been recorded in this area to date. One is located on a terrace of the Embarras River and two occur on the shores of Fickle Lake. All represent the buried remains of seasonally occupied prehistoric campsites that might date back as far as 12 000 years, but more likely relate to the last 5000-6000 years of occupation of the region.

Despite the limited studies undertaken to date, there is high potential for additional finds in this areas, as indicated by the above occurrences as well as from the results of studies undertaken in adjacent or other geographically similar areas in the region. Topographically, the area consists of rolling, heavily forested foothills with considerable numbers of small lakes and bogs as well as numerous water courses. This type of terrain, with its widely distributed resources, is likely to have supported a boreal forest type of adaptation.

Areas with high potential for prehistoric site occurrence are widespread but relatively specific in nature. Terraces along major rivers have the highest potential, especially those facing south and in the vicinity of stream confluences. A dense concentration of sites along the Embarras River just to the west of the RMA demonstrates the use of this drainage. Similar patterns can be expected along the McLeod, Pembina and Erith rivers. Because none of these systems go beyond the mountain fronts, sites along these rivers probably represent seasonal exploitation of local resources rather than intra-regional travel.

Smaller drainages also exhibit potential for site occurrence, as demonstrated in more westerly RMAs in the planning area, although to a somewhat lesser degree than the major systems. Sites along these drainages probably involve short-term use of the local region, but represent important aspects of regional settlement patterns. Moose, Wolf, Dismal, Hanlan and an unnamed creek in the north-central part of the RMA have been identified as having such potential.

Lakeshores have particularly high potential for site occurrence. This is evidenced by the finds around Fickle Lake in the north and Minnow and Wolf lakes immediately east of the planning area boundary. Sites in these locations probably took advantage of aquatic resources such as fish (in the larger lakes), beaver and waterfowl. Ungulates such as moose are frequent browsers in these areas and were undoubtedly also exploited by prehistoric groups.

Finally, additional potential for site occurrence exists in various high benches and ridges that overlook wetlands or rivers and stream junctions. These were used frequently by prehistoric natives as game observation posts and temporary camps.

Paleaontological - The Edson South-Pembina RMA is representative of the plains physiographic area. The plains area is underlain by Cretaceous and Palaeocene non-marine beds (Brazeau and Paskapoo Formations). Exposures are presently limited to a few areas along major rivers, and road and railway cuts.

Objective

1. The broad historical management objectives apply.

Guidelines

1. All major developments, such as coal-mining, quarrying operations and major road construction, should be preceded by a palaeontological impact assessment.

2. The Archaeological Survey of Alberta will participate in the land use referral process to review developments proposed in areas of the RMA considered to have historical resource potential. The historical resources sensitivity map will outline areas of historical resources potential for which the Department of Culture and Multiculturalism will request referral of proposed development projects.

Rangeland

A portion (2784 ha or 6880 ac.) of the Sang Lake Provincial Grazing Reserve is located within the planning area and within this RMA. Improved grazing is provided on 1249 ha (3086 ac.) in this RMA. It provides, under a multiple land use context, improved cattle grazing opportunities for area farmers and/or ranchers. The reserve has a carrying capacity of 900 animal units per grazing season. Other domestic livestock grazing in the RMA relates primarily to horse use.

Objective

1. To permit and direct domestic livestock grazing in the Sang Lake Provincial Grazing Reserve.

Guidelines

1. The 1985 carrying capacity (900 animal units per grazing season) of the Sang Lake Provincial Grazing Reserve will be maintained as a minimum.

2. Only temporary grazing will be encouraged within this RMA outside the Sang Lake Provincial Grazing Reserve.

Access

The recently upgraded Highway 47 represents an important regional roadway for industrial and recreational traffic in this RMA.

Objective

1. To ensure safe access to the recently upgraded Highway 47, which functions as an important regional link between highways 16 and 11.

Guideline

1. The broad access management guidelines apply.

3.3 Robb Highlands Resource Management Area

The Robb Highlands RMA is an area of approximately 2212 km^2 (854 sq. mi.) in the central portion of the Coal Branch planning area (Figure 6).

Ecoregions represented include Boreal Foothills, Boreal Uplands, and Subalpine, with the Boreal Uplands, covering the greatest area. Lodgepole pine is the dominant tree species in the area; however, aspen, white and black spruce, subalpine fir, Engelmann spruce and other species may also be found here.

The topography varies from flat to gently rolling foothills in the north and east, to steeply rolling foothills in the western and southern portions of the RMA. Other features include numerous wetlands and a pronounced northwest-to-southeast trending ridge in the central portion of the RMA.

The management intent for Robb Highlands RMA is to provide for a range of multiple use activities while recognizing the area's resource values.

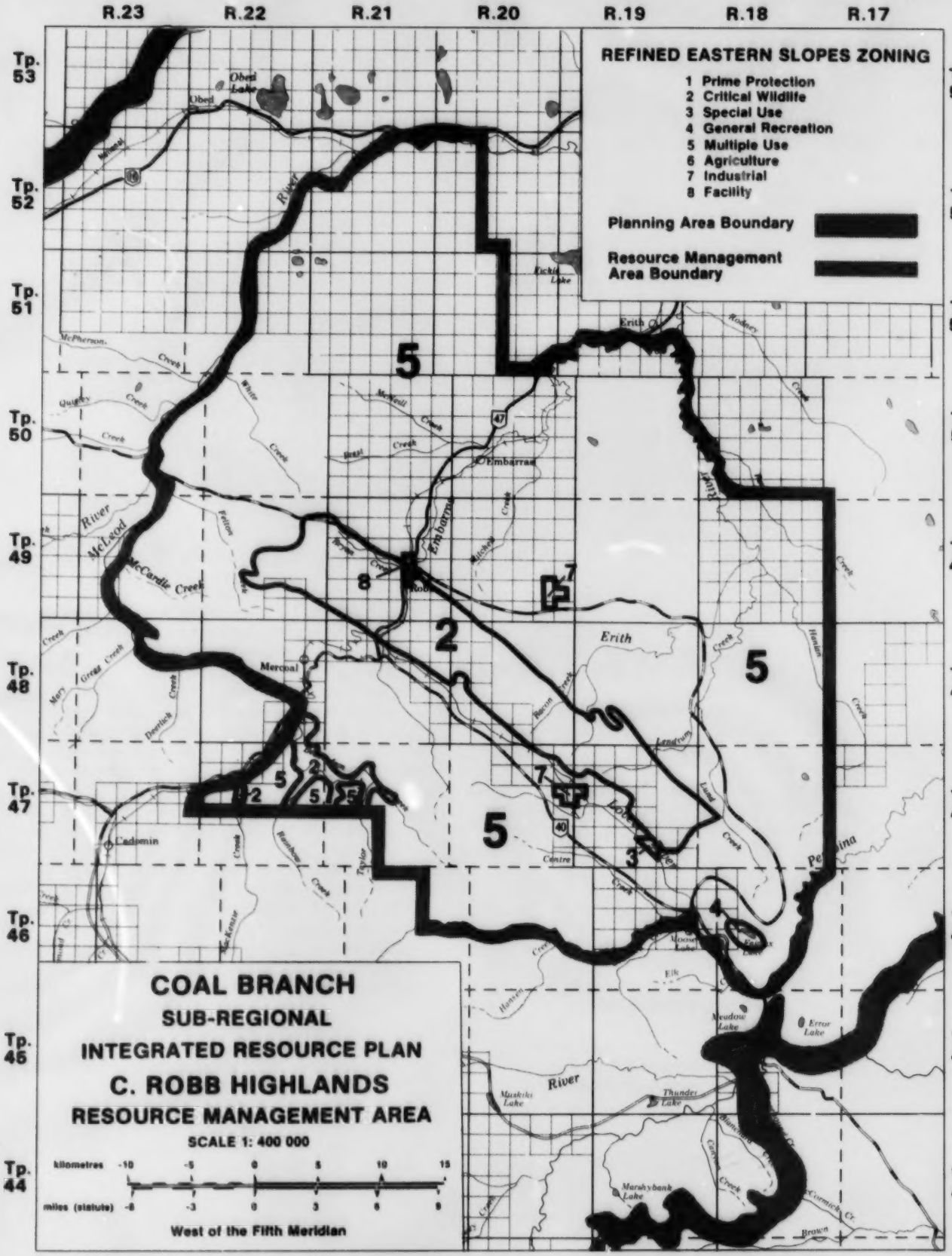

Figure 6: Robb Highlands Resource Management Area.

Water and Watershed

Most of this RMA is within the McLeod River drainage with only a small southern area draining into the Pembina River. The Erith and Embarras rivers, two major tributaries of the McLeod, form part of the RMA's eastern boundary. Part of the headwaters of the Pembina River are within this RMA. These streams are fast-flowing with considerable erosive power. They can result in over-bank flooding near Robb. The RMA's topography varies from flat to gently rolling foothills in the north and east, to steeply rolling foothills in the western and southern portions. Soils are generally finer textured and more erodible in the eastern portion of the RMA, although slope steepness is not as great a concern. In the past, there have been a number of erosion and water quality problems associated with land uses (e.g., timber activities). Any large, intensive resource developments have the potential to significantly affect the water resources in this RMA.

Objective

1. To ensure that existing and future resource developments do not result in unacceptable changes in water quality or quantity.

Guideline

1. Resource development activities, such as coal-mining, timber harvesting, and petroleum and natural gas exploration and development, will be reviewed and monitored to minimize negative impacts on water quality and quantity.

Minerals

Coal-bearing strata underlie the entire RMA; however, more than half the area is not technically feasible for surface mining given current technology. Important coal reserves estimated at 1700 megatonnes have been identified in the designated McLeod River and Coalspur coal fields and the Thompson Creek isolated coal deposit. The permit areas for the Coal Valley mine presently in operation, and the proposed Mercoal project, are contained within the RMA, while a portion of the permit area for the proposed McLeod River project is located in the northwest part of the RMA. Three other coal exploration project areas are also located in this area.

Six entire natural gas fields and portions of six others are located in this RMA, along with one gas processing plant. No petroleum is being produced from these 12 gas fields. There are sulphur reserves (sour gas) in the Hanlan and Lambert gas fields.

Objective

1. To ensure opportunities for exploration and development of coal, the petroleum and natural gas resources associated with the many coal deposits, and the natural gas fields in the area.

Guidelines

1. Mineral exploration and development will follow the existing approval processes.

2. Exploration and development of mineral resources will be permitted in LSDs 15 and 16, Sec. 3, Twp. 47, Rge. 19, W5M, north of the Lovett River, and is LSDs 1 and 2 and the south half of LSDs 7 and 8, Sec. 10, Twp. 47, Rge. 19, W5M under the existing approval processes, provided the integrity of the historical resource site remains intact. Mineral activities should attempt to avoid having an impact on historical resources within this area. Where avoidance is not possible, the project must be designed to minimize disturbance to the resource and mitigative measures must be undertaken where necessary.

Timber

This RMA contains all of the E3 and E1N and parts of the E4N and E5 FMUs. E1N and E4N are within Weldwood of Canada Ltd's. Forest Management Agreement area, which gives them the right to manage and harvest coniferous timber. The E5 area within this RMA is also part of Weldwood's FMA area. The E3 FMU covers the Coal Valley area and

was set up to salvage timber in advance of coal development. E3 is not managed on a sustained-yield basis at present but in the future, following reclamation, it is expected to provide a sustained yield of timber.

Objectives

1. To ensure that Weldwood of Canada Ltd. manages that portion of their FMA in Forest Management Units E4N, E1N and E5 to provide a sustained yield of coniferous timber.

2. To maintain an optimum sustained supply of deciduous timber where not in conflict with coniferous timber production.

Guidelines

1. The detailed management plan for Weldwood of Canada Ltd. will be followed.

2. Integrated coniferous and deciduous planning and operation will be encouraged.

Wildlife

A diversity of wildlife habitat exists in this RMA. The deciduous and coniferous forest cover, with a shrubland complex found along the Lovett Ridge, supports populations of moose, elk and deer much higher than those found in surrounding areas. Outside the ridge complex, several minor watercourses provide good ungulate habitat. Hunting is an important recreation activity in the RMA.

Objectives

1. To increase the elk population from 100 to 300 animals, with half the increase to occur in Zone 2 areas.

2. To maintain moose densities of 0.6/km^2 in the Beaverdam Creek and Lovett Ridge Zone 2s, and to increase moose densities from 0.3/km^2 to 0.5/km^2 outside Zone 2.

3. To provide for a general increase in the mule deer population.

Guidelines

1. Escaped/abandoned horses will be controlled to limit competition with elk.

2. Horse grazing in the critical elk wintering range will be managed so as to maximize forage production for elk.

Fisheries

Fairfax Lake is a regionally significant recreational fishery for rainbow trout and brook trout. Many productive stream fisheries are present in the McLeod, Embarras, Erith and Pembina drainages. MacKenzie Creek represents an important bull trout spawning stream. The sport fish species produced in this RMA include rainbow trout, Arctic grayling, mountain whitefish, bull trout and brook trout. Fishing pressure is heavy along main roads and moderate elsewhere. Fishing is a major recreational activity in this RMA.

Objectives

1. To retain a productive recreational rainbow trout and brook trout fishery in Fairfax Lake.

2. To manage the MacKenzie Creek Zone 2 fishery as a naturally reproducing fishery.

Guidelines

1. Fairfax Lake will be stocked annually with rainbow trout.

2. Degradation of the quality of the MacKenzie Creek fishery will be avoided through the management of recreational access.

Recreation and Tourism

This RMA supports a high level of outdoor recreation with most of the use being concentrated along major travel corridors (highways 47 and 40 and Weldwood's Robb-Hinton Road). Sportfishing is very popular in

this RMA. Hunting is another important recreation activity here. Other current recreation activities include hiking, equestrian use, year-round OHV use, snowmobiling and auto touring. There are scenic viewing opportunities along the major public roads (e.g., Scenery Hill on Highway 47).

The Alberta Forest Service operates four recreation areas in this RMA (i.e., Coalspur, Lovett River, Fairfax Lake and Pembina Forks). These sites have a combined capacity of 78 campsites, 14 day use sites and 15 parking sites. Fairfax Lake is a popular recreation and tourism destination point that has been upgraded. Boating and year-round fishing are popular here. A moderate level of random camping also occurs in this RMA, concentrated along the Forestry Trunk Road (Highway 40) and the Pembina River.

The hamlet of Robb currently provides some tourist services and facilities. The general Robb area is recognized as a staging area by the snowmobiling community. Any additional development of tourist-related facilities in this RMA should be encouraged in Robb, providing they do not require a pristine setting.

Activities that provide an awareness of the historical aspects (e.g., settlements at Lovettville, Coalspur, Mercoal) and resource industries (past and present) could broaden the visitor's knowledge of the area.

Objectives

1. To provide and maintain auto-access camping, day use and water access facilities.

2. To provide and maintain trails and staging facilities for equestrian use, hiking, snowmobiling, off-highway vehicle use and water-based recreation.

3. To maintain the recreational capability of specific areas and river corridors, including Fairfax Lake (Zone 4) and the Pembina, Erith and Embarras rivers, identified as having a high potential for present or future use or development.

4. To recognize highways 40 and 47 as the primary focuses for auto touring opportunities, and encourage the development of scenic and interpretive pull-off areas.

5. To manage the visual landscape qualities along highways 40 and 47 (to line of sight).

6. To encourage the maintenance and provision of commercial facilities and services in Robb.

7. To provide opportunities for the private sector to meet the needs of the area's recreational users.

8. To recognize the potential to provide interpretive opportunities based on historical and industrial activities.

Guidelines

1. Developments will be reviewed to minimize any impacts on areas of high recreation value (e.g., highways 40 and 47, Embarras and Erith rivers). This will ensure maintenance of their aesthetic values.

2. Any future major road upgrading plans for highways 47 and 40 should consider the development of scenic and interpretive pull-off areas (e.g., Scenery Hill). The departments of Tourism and Culture and Multiculturalism, and other interested agencies, will assist the Department of Transportation and Utilities in identifying appropriate sites.

3. The Department of Tourism will, upon request, provide counselling assistance to groups interested in establishing industrial or historical tours for the public.

Historical Resources

Archaeological - The Robb Highlands RMA is the archaeologically best known region within the Coal Branch. Archaeological inventories conducted in conjunction with proposed highway, coal-mining and petroleum

projects have resulted in the identification of surprisingly dense concentrations of prehistoric sites. These occur in a wide variety of topographic locations within this outer foothills area. While excavations conducted to date reveal these are primarily the remains of native campsites dating to the middle prehistoric period (7000-3000 years ago), sites as old as 12 000 years may also occur in this area. It is expected that large numbers of undiscovered sites exist in areas that have had no previous examination.

Topographically, the majority of the Robb Highlands RMA can be characterized by linear northwest-southeast trending foothills thrust ridges with low-lying, intervening valleys. These valleys contain small rivers, streams or large wetlands. It is within these valley systems, and along the major drainages that crosscut them, that the majority of the sites identified to date occur. The lower reaches of the Embarras and Erith rivers, and the middle and upper reaches of the Pembina River, have not been surveyed yet but are believed to have extremely high potential for site discovery. As with other regions, broad, flat, south-facing terraces, especially near stream junctions, are particularly sensitive.

The Lovett River and the upper reaches of the Embarras have produced the greatest concentrations of known sites, some of which are highly significant. Other moderately sized drainages, such as the Erith, may be expected to exhibit similar patterns. Perhaps most surprising is the extensive prehistoric use of the smaller valleys drained by, for example, White, Hay, Chance, McCardle and several unnamed creeks. While the sites are generally quite small, they reveal a significant land use pattern that has not been recognized in other areas of the northern Eastern Slopes. Key sites relating to specific time periods or activities probably occur along other small drainages within the RMA.

A few lakes occur in the Robb Highlands RMA, but none have been investigated. Based on the results of studies in adjacent areas, it is expected that significant sites will occur around their margins. The margins of wetland areas also exhibit potential for site occurrence. Several sites identified in this area occur on ridges overlooking stream valleys or other good grazing areas. These locations are used frequently as temporary campsites and workshops while observing game movements. A number of such locations have been identified as exhibiting potential for site occurrence.

One of the most important aspects of the archaeological potential of this region relates to the possibility of very ancient sites. The foothills in this area once formed part of a presumed ice-free corridor connecting the Bering Straits area with the southern interior of the continent. It is presumed that the first Americans entered the continent through this corridor. The remains of their passage may occur in this area, especially since there is some indication that late Wisconsin glacial ice may not have affected this area. This site may not be deeply buried. If found, it may possibly be of international significance.

Palaeontological - The Robb Highlands RMA contains both the plains and foothills physiographic regions. At present, very little fieldwork has been conducted in the area, and there is only one known fossil-producing site in the RMA (fish remains from a coal-mine near Robb). However, the area is considered to have high potential for discovery of additional sites.

Exposures are present in river valleys, road and railway cuts, abandoned mines and along ridges. Any major development in the RMA, including road construction, coal mining and quarrying operations, should be preceded by a palaeontological impact assessment.

Historic Period - The historic townsite of Lovettville, established in 1911, represents the first of the Coal Valley communities and is a well-preserved historic site. Standing log and frame structures, collapsed log and frame structures, foundation remains, surface mine workings and collapsed entries, and a variety of historic materials representing the remains of past mining and residential usage of the area are all present at the site.

Lovettville represents the only former coal mining community in the Coal Branch in which the structural remains have not been modified or destroyed since abandonment. Mountain Park and Lovettville were the first two communities and mines in operation in this area of the province, and Mountain Park has since been destroyed. Lovettville, therefore, represents one of the few, if not the only, Eastern Slope mining community of that age in the province that is still relatively intact. As such, the preservation of this townsite is of major concern to the Department of Culture and Multiculturalism.

The remains of other structures relating to these activities may exist throughout the RMAs and would be of interest to the Department of Culture and Multiculturalism.

Objective

1. To protect the Lovettville Historic Townsite from physical impact related to any future development in the area, and to preserve this resource for future generations.

Guidelines

1. All development proposals within the Lovettville Historic Townsite (Zone 3) shall be referred to the Department of Culture and Multiculturalism.

2. The Archaeological Survey of Alberta will participate in the land use referral process to review developments proposed in areas of the RMA considered to have historical resource potential. The historical resources sensitivity map will outline areas of historical resources potential for which the Department of Culture and Multiculturalism will request referral of proposed development projects.

Rangeland

Local residents graze their horses in this RMA. This historical use of the rangeland resources is recognized; however, the opportunity to provide additional rangeland for horse use is limited.

Objectives

1. To provide for authorized horse use of forage resources based on the existing use and where compatible with other resources.

2. To ensure that good range condition is maintained.

3. To accommodate range improvement or grazing opportunities where not in conflict with the timber producing capability of the sustained-yield land base.

Guidelines

1. The historical use of forage resources by horses will be recognized and the existing levels of use will be maintained. Expansion opportunities are recognized as being limited.

2. Authorized horse use of the forage resources will be monitored and managed.

3. Range management plans will recognize Weldwood's detailed forest management plan.

Settlement

The hamlet of Robb (Zone 8) is located within this RMA. The Improvement District of Yellowhead, No. 14's general municipal plan and land use order will guide this community's development. The primary employers are the coal and forestry industries. Some residents of Robb live only part-time within the community. Many of these are recreationists from Edmonton. Robb has the potential to provide additional tourism-related facilities, although at present it offers only a few.

The once thriving coal community of Mercoal is used part-time mainly by Edmontonians whose families once worked for the coal industry in this area. They consider themselves to be a part of the culture of past coal towns.

Objectives

1. To maintain the present hamlet boundaries of Robb and expand only when a need is identified by the Improvement District of Yellowhead, No. 14.

2. To maintain Mercoal as a seasonal residency and short-term leasehold area.

Guideline

1. The General Municipal Plan and Land Use Order for the Improvement District of Yellowhead, No. 14 will direct the development of settlements and of other rural residences.

Access

Highways 40 and 47 receive both industrial and recreational traffic. Weldwood of Canada Ltd.s' private Robb log haul road and other industrial roadways associated with oil and gas development are also found in this RMA. A new highway may be required if additional significant resource developments occur (e.g., coal mining).

The recreation use along MacKenzie Creek is resulting in localized areas of erosion. These areas can have a detrimental effect on the fishery. An inventory will be necessary to identify the problem areas and determine the action necessary to resolve the problems.

Objectives

1. To ensure safe access to the recently upgraded Highway 47, which functions as an important regional link.

2. To develop a long-term highway network that is responsive to the long-term activity and public road needs of the coal, oil and gas, forestry and tourism industries, public recreation needs, as well as to existing communities.

3. To identify the problem areas and determine the management necessary for the MacKenzie Creek drainage.

Guidelines

1. The maintenance of visual landscape quality along any new proposed highway will be considered for all resource developments visible from the roadway.

2. The MacKenzie Creek drainage will be inventoried. Access management of motorized and non-motorized recreation use will be considered for this drainage.

3. The rights to the land base required for re-alignment of Highway 40 will be protected.

3.4 Cardinal-Brazeau Resource Management Area

The Cardinal-Brazeau RMA is an area of approximately 1100 km^2 (425 sq. mi.) in the southern portion of the Coal Branch planning area (Figure 7).

Most of the RMA is identified as part of the Subalpine Ecoregion, although some Boreal Uplands and Alpine ecoregions are also identified here. The forest cover is typically coniferous, with lodgepole pine being the dominant species and black and white spruce being subdominant.

The Rocky Mountain foothills is the major physiographic feature, and typically consists of northwesterly trending ridges.

The management intent for Cardinal-Brazeau RMA is to recognize the high importance of watershed protection, fisheries, extensive recreation, historic resources and timber development commitments while providing a range of multiple use opportunities.

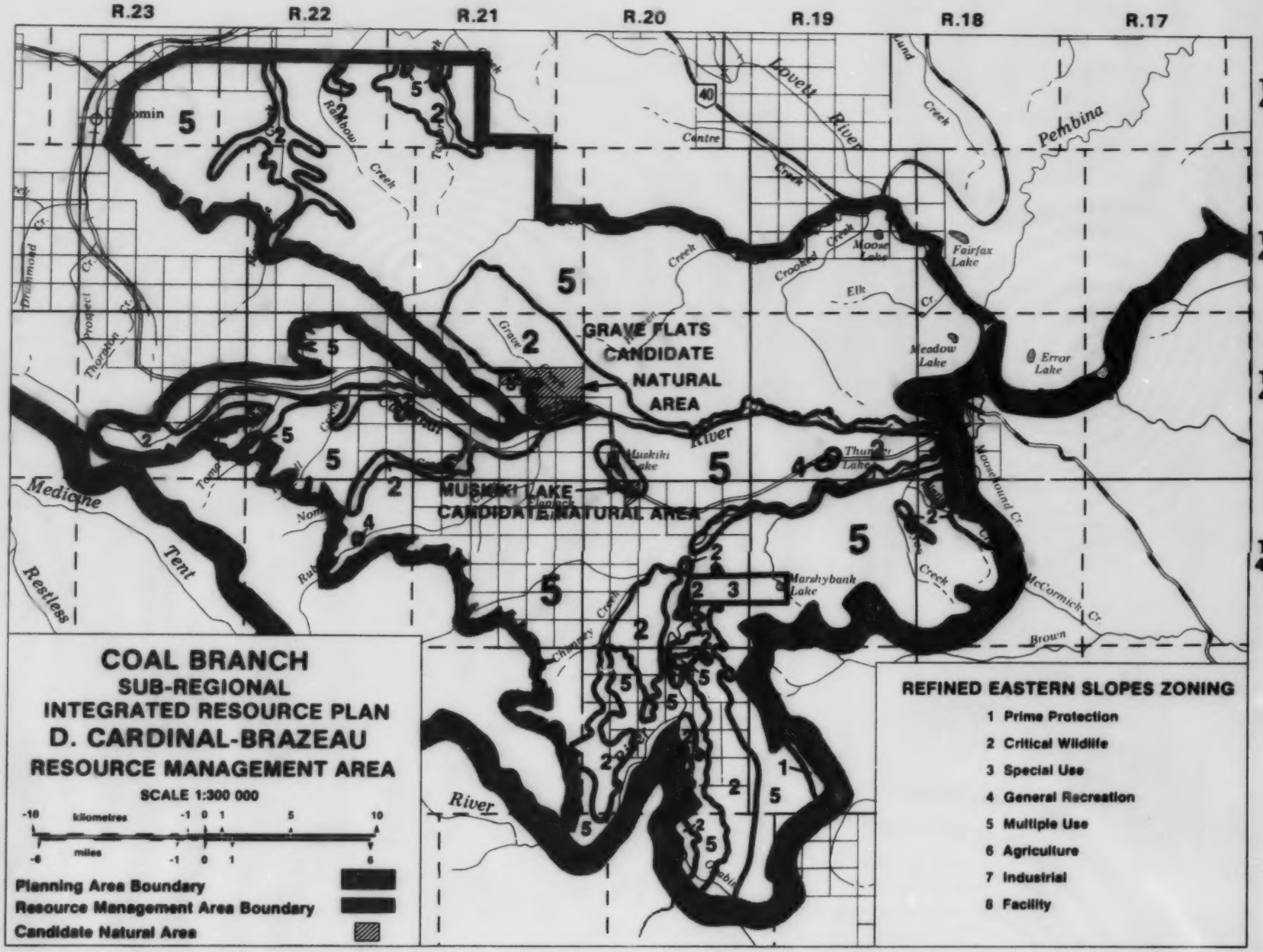

Figure 7: Cardinal-Brazeau Resource Management Area.

Water and Watershed

This RMA is a part of the Brazeau River drainage and contains most of the Cardinal River watershed. This river system flows through wide valleys with very coarse, gravelly substrate. Most of the watercourses originate directly from the Rocky Mountain front ranges. These streams have a very high gradient, are fast flowing and have a quick initial response to storms. Major creeks in the Brazeau drainage are Thistle, Chimney, Canyon, Marshybank and Coast creeks. The Southesk River drains into the Brazeau along the southern tip of the RMA. The Cardinal joins the Brazeau near Thunder Lake. It has characteristics similar to the Brazeau River, but has even greater runoff, allowing most of the precipitation received to leave as streamflow. Major creeks in the Cardinal drainage are Toma, Russell, Nomad, Ruby, Grave and Muskiki.

With most of the RMA being within the Rocky Mountains front ranges, it receives a considerable amount of snow and produces relatively high volumes of clean water. Although slope steepness is a major watershed concern, the very coarse and rocky soils mitigate their erosion potential. Previous resource exploration and road construction have stabilized and do not appear to be affecting water quality. Since both the Brazeau and Cardinal rivers drain into the North Saskatchewan River basin, downstream use of water is a major consideration for any development that would affect the quality and quantity of the water resource.

Objective

1. To ensure that the integrity of the watercourses and streamflows are maintained because of their inherent importance to downstream users of the North Saskatchewan River Basin.

Guideline

1. Water quality and quantity for downstream users should be a prime consideration for any resource developments.

Minerals

About 20 percent of the RMA is underlain by coal-bearing strata. The Southesk coal field is located entirely within this area. This RMA also contains the southern tip of the Coalspur field as well as the Grave Flats and Muskiki Lake isolated coal deposits.

Parts of three natural gas fields extend into this area which has had only limited oil and gas exploration and development.

Objectives

1. To provide opportunities for coal exploration and development.

2. To provide opportunities for the exploration and development of other minerals (e.g., petroleum and natural gas).

Guideline

1. Mineral exploration and development in these areas will follow the existing approval processes.

Timber

This RMA contains all of the E11 FMU and approximately two-thirds of the E5 FMU. E11 contains a relatively high volume of overmature timber, which is of concern due to potential forest protection problems (fire, insects and disease). E11 has one coniferous quota, with much of the remainder of the unit being part of Weldwood of Canada Ltd.'s FMA area.

Maintenance of visual quality is also a concern in the E11 FMU, which will be managed as a separate unit.

E5 contains two coniferous quotas, one coniferous miscellaneous timber use area and a quota that forms part of the wood supply for a wood processing facility in the Edson area. A portion of E5 is also within Weldwood of Canada Ltd.'s FMA area. The timber resource of E5 has been fully committed.

Objectives

1. To provide, on a sustained yield basis, timber resources for quota holders, local operators and the FMA holder.

2. To ensure that Weldwood of Canada Ltd. manages that portion of the FMA area in forest management units E11 and E5 to provide a sustained yield of coniferous timber.

3. To minimize the effect of timber harvesting on visual resources.

Guidelines

1. The timber management plans for the forest management units will be followed. These timber management plans consider other resource values.

2. The detailed forest management plan for Weldwood of Canada Ltd. will be followed.

3. The Forest Landscape Management Strategies for Alberta (Alberta, 1988c) will be followed.

Wildlife

Good elk habitat is present in the Cardinal, Brazeau and Southesk river drainages. Elk numbers are relatively low at present, primarily because of excessive native hunting. In the northern part of the RMA, good elk and moose habitat is present in the MacKenzie and Beaverdam creek areas. In the majority of the area, moose habitat is relatively poor. Bighorn sheep are present on the Chungo Ridge.

Objectives

1. To maintain a bighorn sheep population of 65 to 70 animals on the Chungo Ridge.

2. To increase the elk population from 35 to 70 animals, primarily in Zone 2 areas (e.g., Beaverdam and MacKenzie creeks; Cardinal, Brazeau and Southesk rivers).

3. To maintain the present moose densities or allow for a small increase.

Guidelines

1. Escaped/abandoned horses will be controlled to limit competition with elk.

2. Recreational disturbances on alpine areas of the Chungo Ridge Zone 1 will be minimized in order to limit the disturbance to the bighorn sheep.

Fisheries

Several important bull trout spawning streams exist within the Cardinal and Brazeau river drainages. Fishing pressure is moderate. Valuable recreational fisheries are present in Muskiki Lake (brook trout) and Ruby Lake (brown trout, bull trout).

Objectives

1. To maintain viable recreational fisheries in Muskiki and Ruby lakes.

2. To manage bull trout as a naturally reproducing stream fishery.

3. To establish a population of cutthroat trout in the Cardinal River.

4. To maintain the recreational, environmental and aesthetic values as well as the recreational fisheries of high mountain lakes.

Guidelines

1. Fisheries and recreational management plans will be coordinated in high mountain lakes to ensure the retention of environmental and aesthetic qualities, and to maintain the recreational fisheries' potential.

2. Size limits and low catch and possession limits will be maintained on bull trout in order to retain viable populations.

3. Cutthroat trout will be stocked in the Cardinal River in an attempt to introduce a naturally reproducing population.

4. Critical stream reaches for trout spawning will be identified further.

5. Critical stream reaches for trout spawning will be protected from habitat degradation.

Recreation and Tourism

This RMA supports a moderate to high level of outdoor recreation use, most of which is concentrated adjacent to the Grave Flats roadway. This roadway is the only auto-access route in this RMA and offers good scenic viewing opportunities. Only the eastern portion of this route, from Highway 40 west to the Muskiki Lake area, is maintained year round; hence, the western portion provides seasonal access only.

Ruby and Muskiki lakes are the focal lake-based recreation use points in the RMA. There is a low-to-moderate level of hiking and equestrian use in the western portion of the RMA, as well as up the Brazeau River into Jasper National Park and in the neighbouring Rocky/Clearwater Forest. The resource potential exists for Class II commercial trail riding permits in this RMA.

A provincial equestrian trail riding group is interested in moderately improving the historical Big Horn Trail for equestrian use.

The Alberta Forest Service operates one campground at the Cardinal River which receives limited use; it has 11 campsites. Some consideration may be given to closing it because of budget constraints. Random camping from motorized and non-motorized users occurs along the Grave Flats roadway. OHV use and snowmobiling presently occurs along the lower elevations where a view of the neighbouring mountainous Nikanassin RMA can be obtained. A recreation user conflict between equestrian and OHV users has been identified along the Cardinal River and Ruby Creek.

The Brazeau-Cardinal RMA is well suited to backcountry use such as hiking, fishing, hunting and equestrian use. Public input has indicated there is interest in maintaining the visual qualities for recreation and tourism opportunities, particularly in the western portion of the RMA. Facilities and services that support the outdoor recreation activities, such as equestrian trail riding and commercial lodges and campgrounds, could be considered.

A reach of the Brazeau River has been designated as Class III (difficult) for canoeing. Potential may exist for water-based opportunities along the Brazeau River. However, the Brazeau and Cardinal rivers fluctuating water levels may limit commercial rafting opportunities. Safety is also a concern here.

Objectives

1. To provide and maintain opportunities for auto-access, camping and day use activities.

2. To provide and maintain trails and associated support facilities for equestrian use, hiking, OHV use, snowmobiling and water-based recreation.

3. To maintain the recreational capability of specific areas and river corridors, including Muskiki and Thunder lakes (Zone 4) and the Cardinal and Brazeau rivers, identified as having a high recreation potential for present or future recreation use or development.

4. To recognize the Grave Flats Road as the focus for auto touring opportunities, and encourage the development of scenic/interpretive viewpoints at such time as touring use increases in this area.

5. To manage the scenic landscape qualities along the Grave Flats Road (i.e., to line of sight).

6. To provide opportunities for commercial trail riding operations.

7. To consider development of commercial backcountry lodges, commercial campgrounds and associated recreation developments where compatible with other resource values.

8. To maintain the recreational value of high mountain lakes (e.g., Ruby Lake/Zone 4) by coordinating recreation and fisheries management plans.

9. To coordinate recreation and fisheries management plans.

Guidelines

1. Any impact on areas of high recreation value (e.g., Grave Flats Road) will be minimized to maintain the visual qualities.

2. Priority will be given to the development of extensive recreation activities and primitive wildland developments that are compatible with the area's backcountry qualities.

3. Any future major road upgrading plans for the Grave Flats Road should assess the feasibility for development of scenic and/or interpretive viewing pull-off areas at appropriate locations.

Historical Resources

Archaeological - The Cardinal Brazeau RMA encompasses the basins of both of these rivers. Almost no archaeological studies have taken place within this region. As a result, the potential for significant archaeological sites must be extrapolated from information generated in adjacent or topographically similar areas elsewhere in the region.

Neither of these river flow through passes allowing access into British Columbia. Therefore, prehistoric use of these valleys as travel routes would be largely restricted to use of local resources.

Nevertheless, the Brazeau valley allows access into the Athabasca and North Saskatchewan drainages over Nigel Pass into Jasper National Park. Sites reflecting interregional travel may be expected along this drainage.

In a general sense, major rivers serve as the focal points for seasonal game movements and provide relatively level access corridors into a wide variety of exploitable resource areas. Consequently, prehistoric sites reflecting important parts of local settlement and resource use patterns can be expected to occur along these valleys (Cardinal, Brazeau, Southesk).

Based on the dispersed settlement patterns revealed in the Robb Highlands RMA, smaller drainages within the Cardinal-Brazeau RMA may also contain significant numbers of archaeological sites representing seasonal exploitation of local resources.

In similar patterns to those evidenced elsewhere, lakeshores are also believed to contain potential for site occurrence. Larger lakes such as Muskiki, Thunder and Marshybank undoubtedly exhibit potential, but so do many of the smaller lakes where ungulates and beaver may be the prime resource rather than the wide variety of aquatic species that are characteristic of the larger lakes.

Ridges overlooking stream valleys and isolated uplands with good views into grazing areas are considered to have potential for temporary campsites and workshops. Among those identified as being sensitive is a unique occurrence of glacial eskers around Thunder Lake. Such features have potential for the location of very ancient sites.

Being somewhat closer to the mountains, there is slightly less potential for ancient sites relating to the initial occupation of the ice-free corridor than there is in the Robb Highlands RMA, but nevertheless the possibility remains.

Palaeontological - To date, very little palaeontological investigation has occurred in this RMA and there are no known fossil-

producing sites in the area. However, the RMA is representative of the foothills physiographic region, which has yielded fish and dinosaur remains in RMAs to the north. Exposures are present in river valleys, road-end railway cuts, abandoned mine sites and along ridges throughout the RMA. The area is considered to have high potential for the discovery of fossil remains. Consequently, any major development in the RMA, such as coal mining, limestone quarrying operations or road construction activities, should be preceded by a palaeontological impact assessment.

Objective

1. The broad historical management objectives apply.

Guideline

1. The Archaeological Survey of Alberta will participate in the land use referral process to review developments proposed in areas of the RMA considered to have historical resource potential. The historical resources sensitivity map will outline areas of historical resources potential for which the Department of Culture and Multiculturalism will request referral of proposed development projects.

Ecological Resources

Ecological resources are unique or representative ecological features or systems that have been identified as being of significance. On July 1, 1987, the Marshybank Ecological Reserve was established (1218 ha or 3010 ac.) under order-in-council. The area contains a forest landscape with areas of meadows and wetlands, representative of the main foothills sub-region of the foothills natural region of Alberta. The ecological reserve designation provides an opportunity to manage this part of Alberta's natural heritage for future generations. The Marshybank Ecological Reserve is split into two portions by a half mile strip of land that provides for future access to other resources.

Two candidate natural areas are found within this RMA. The candidate Muskiki Lake (128 ha or 316 ac.) Natural Area is located in the E32 (W/road) Twp. 44, Rge. 20, W5M. A protective notation has been placed on these lands in recognition of the significance of its natural features for education. The area represents an example of a rich patterned fen with uncommon plant species.

Grave Flats is the other candidate natural area. Located in 13 (N/road), 14 (N/road), N22, 23, 24, Twp. 45, Rge. 21, W5M, it is approximately 775 ha (1915 ac.) in size. A protective notation has been placed on these lands in recognition of the significance of the natural features and historical value for education. The area represents a perched, patterned fen. Its extensive willow-birch shrublands have several uncommon plant species. This site is also of historical value since Chief Cardinal's gravesite is located here.

Objectives

1. To protect representative features of the main foothills sub-region of the foothills natural region of Alberta.

2. To protect sites with potentially significant natural features (e.g., fens) and/or historical value.

Guidelines

1. A management plan will be prepared for the Marshybank Ecological Reserve (Zone 3). The Alberta Forest Service will be responsible for the on-site management.

2. A protective notation will act as a holding mechanism for the Muskiki Lake and Grave Flats sites until the type of further protection, such as natural area designation, is approved and established.

Rangeland

Horse grazing is recognized as a seasonal use within the RMA. Thus, only temporary permits are issued for horse grazing.

No permanent grazing opportunities will be provided here.

Objective

1. To ensure that good range condition is maintained.

Guidelines

1. Only temporary horse grazing opportunities will be permitted.

2. Authorized horse use of forage resources will be managed.

Access

The Grave Flats Road provides seasonal auto access because the total roadway is not maintained year-round. It is the only roadway within the RMA. With limited resource development, this RMA remains fairly inaccessible to most motorized recreationists. The only exception are OHV users. OHV use occurs at moderate levels throughout the RMA, but is heavy on routes to Ruby Lake and along MacKenzie Creek in association with use of the Mountain Park area. OHV use is also popular along the headwaters of the Cardinal River.

The recreation use along MacKenzie Creek is resulting in localized areas of erosion. For a description of MacKenzie Creek, refer to the access and fisheries sections in the Robb Highlands RMA.

Objectives

1. To assess the access requirements of resource users.

2. To identify the problem areas and determine the action necessary for the MacKenzie Creek drainage.

Guidelines

1. Access management of the OHV use will be addressed when use levels require its consideration as one of the defined recreation programs of this area.

2. The MacKenzie Creek drainage will be inventoried. Access management of motorized and non-motorized recreation use will be considered for this drainage.

3. A corridor separates the eastern and western portions of the Marshybank Ecological Reserve. The corridor provides for future access to other resources.

3.5 McLeod Resource Management Area

The McLeod Resource Management Area is an area of approximately 1116 km^2 (431 sq. mi.) in the western portion of the Coal Branch planning area (Figure 8).

The dominant ecoregion is the Boreal Uplands, although the Boreal Foothills and Subalpine ecoregions are also present. Forest cover is typically coniferous with lodgepole pine being the dominant overstory species. Pure and mixed stands of aspen may also be found, especially in the Boreal Foothills Ecoregion.

The topography varies from low, gentle areas to the more common steeply sloped Rocky Mountain foothills. Major physiographic features include the foothills and High Divide Ridge.

The management intent for McLeod RMA is to provide for a range of multiple use activities, especially timber harvesting and coal exploration and development. In addition, the importance of watershed protection, fisheries, wildlife, extensive recreation and historical resources must also be recognized.

Water and Watershed

Most of the McLeod RMA falls within the McLeod River drainage and is dominated by rolling to steeply rolling foothills with a high density of creeks and tributaries. From

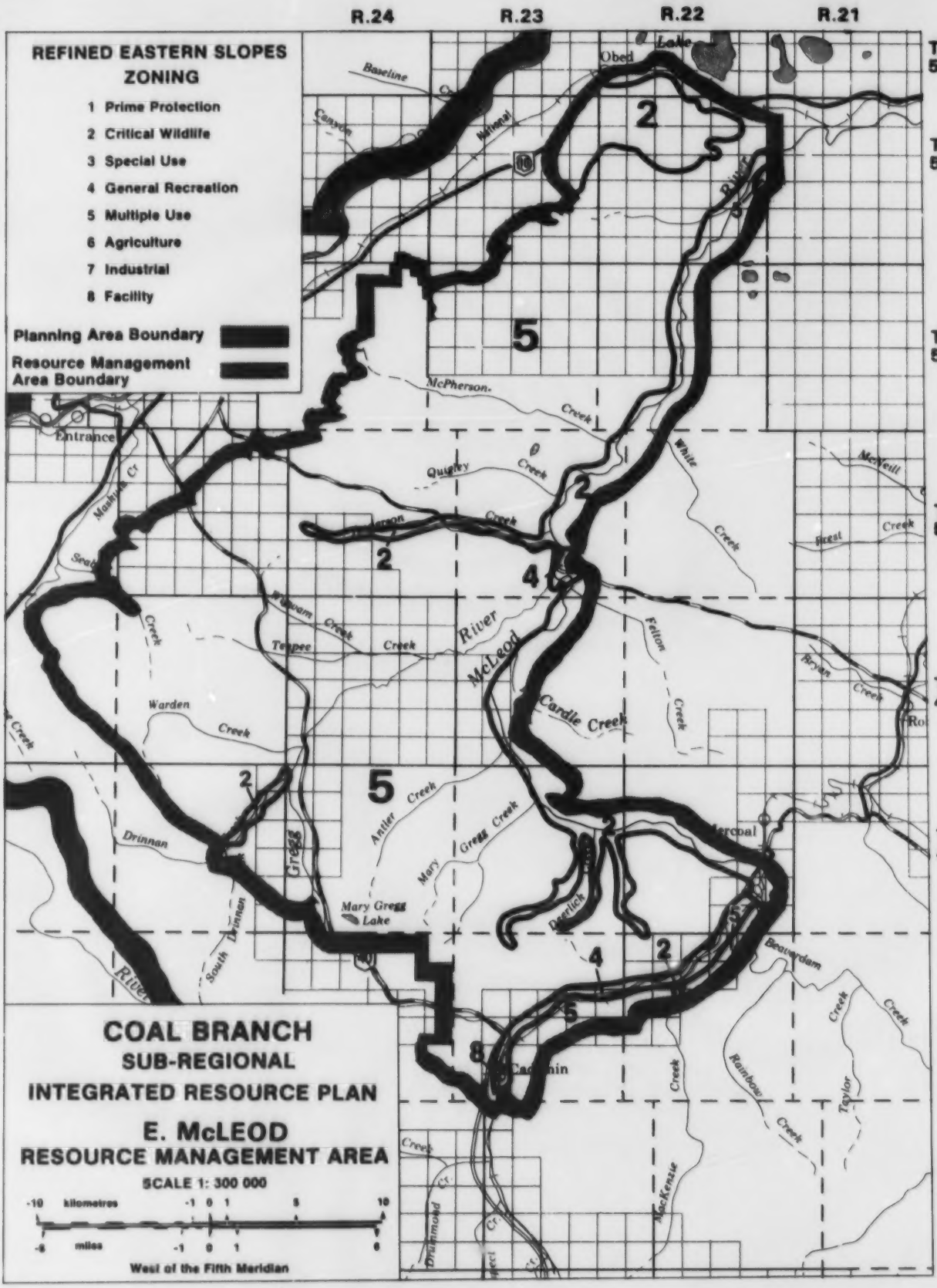

Figure 8: McLeod Resource Management Area.

Cadomin to McCardle Creek, the McLeod flows along a broad alluvial valley indicating quick hydraulic response to storms and high erosion potential. There has been a considerable amount of timber harvesting and road construction in the past which resulted in some erosion problems. However, most disturbances and road crossings appear to have stabilized. The Tri-Creeks watershed study area was in this RMA. This study was initiated to determine the effects of timber harvesting practices and ground rules on water quality and fisheries habitat of the Wampus, Deerlick and Eunice creeks.

Overall, this RMA has the potential for major impacts by intensive resource developments on water quality and quantity.

Objective

1. To ensure that existing and future resource developments do not result in unacceptable changes in water quality or quantity.

Guidelines

1. Although existing operating conditions will apply on resource developments within the Tri-Creeks watershed, a high level of watershed protection is recognized because of the high fisheries values.

2. The domestic water supply needs of the Hamlet of Cadomin will continue to be recognized through the normal review and impact evaluation processes used for coal development.

Minerals

Coal-bearing strata underlies 80 percent of this RMA; except in the Coalspur and McLeod River coalfields, very few observation points are available for resource calculations. Deposits have been identified for McLeod River North, Hardisty Creek, Wigwam and Anderson Creek. Remaining in-place reserves total 290 megatonnes of coal. This RMA contains a portion of the mine permit area for the McLeod River project and most of the exploration project area for the Corral Creek coal property.

To date, no petroleum or natural gas fields have been discovered here.

Objectives

1. To provide opportunities for coal exploration and development, especially in areas associated with the Coalspur and McLeod River coal fields.

2. To provide opportunities for petroleum and natural gas exploration and development.

Guideline

1. Mineral exploration and development will follow the existing approval processes.

Timber

This RMA contains the west half of FMU E4N, managed by Weldwood of Canada Ltd., and a small portion of the E5 FMU. E4N is dominated by even-aged stands of lodgepole pine, while timber resources in the E5 portion of the RMA are generally nonharvestable because of slope constraints.

Objectives

1. To ensure Weldwood of Canada Ltd. manages that portion of the FMA in the Forest Management Unit E4N to provide a sustained yield of coniferous timber.

2. To maintain a sustained supply of deciduous timber, recognizing coniferous timber production.

3. To minimize the effect of timber harvesting on visual resources.

Guidelines

1. The detailed forest management plan for Weldwood of Canada Ltd. will be followed.

2. Integrated coniferous and deciduous planning and harvesting operations will be encouraged.

3. The Forest Landscape Management Strategies for Alberta (Alberta, 1988c) will be used.

Wildlife

Deciduous forests in the Obed Hills area provide valuable habitat for elk and an important overwintering area for moose. The McLeod River valley includes good riparian habitat and a high diversity of habitat types that are well used by elk. Moose densities outside these areas in the RMA are relatively low. Hunting pressure is moderate.

Objectives

1. To increase the elk population from 80 to 200 animals.

2. To increase moose densities from $0.1/km^2$ to $0.3/km^2$.

3. To protect the significant elk habitat and important moose overwintering areas of the Obed Hills and the McLeod River valley Zone 2 areas.

Guideline

1. The broad wildlife management guidelines apply.

Fisheries

Several important bull trout spawning streams are present in the RMA. Rainbow trout, mountain whitefish and brook trout are also common in the foothills streams here. A high number of roads has resulted in moderate to high fishing pressure on most of the streams in the RMA. Maintenance of water quality is a major concern for all river users, including maintenance of the recreational fishery. Mary Gregg Lake provides a valuable recreational rainbow trout fishery. Although the Tri-Creek watershed study is finished, fisheries research will continue on Wampus, Deerlick and Eunice creeks.

Objectives

1. To maintain a viable recreational fishery in Mary Gregg Lake.

2. To protect critical trout spawning stream reaches from habitat degradation.

3. To maintain and enhance the rainbow trout populations native to the Athabasca drainage, in the upper McLeod and Gregg river systems.

4. To manage bull trout as a naturally reproducing stream fishery.

5. To continue the fisheries research in Wampus, Deerlick and Eunice creeks Zone 2 areas.

Guidelines

1. Fish stocking of Mary Gregg Lake will be continued, but siltation will be minimized and water levels will be maintained.

2. Further identification of critical stream reaches for trout spawning will be carried out.

3. Rainbow trout native to the Athabasca drainage will be protected from hybridization with other rainbow trout or cutthroat trout.

4. Size limits and low catch and possession limits will be maintained on bull trout in order to retain viable populations.

5. The habitat of the major bull trout producing streams, Drinnan and Anderson creeks, will be protected through Zone 2 designation.

Recreation and Tourism

The McLeod RMA receives a moderate-to-high level of outdoor recreation use, again concentrated along major travel corridors (Forestry Trunk Road, Gregg River Road, McLeod resources road). Logging

operations along Highway 40 have provided open vistas to the Rocky Mountain front ranges.

The hamlet of Cadomin is an entry point from Highway 40 into the Whitehorse Creek-Mountain Park area. The Coal Branchers, residents of past coal communities, host homecoming reunions near Cadomin. Presently, some tourist services are available at Cadomin. Any additional tourism-related services and facilities in this RMA that do not require a natural outdoor setting, should be encouraged in Cadomin. Potential may exist to develop a serviced campground that caters to those visitors using the area south of Cadomin. Interpretive opportunities, based on the resource industries (past and present) and settlement of the area, could provide visitors with a greater appreciation of the area.

The Alberta Forest Service operates two recreation areas (McLeod River, Watson Creek) with a combined capacity of 62 campsites and eight day use sites. They also maintain a water access point at Steeper with two campsites and 15 parking sites. Random camping occurs throughout the RMA but is highest along the Mary Gregg and McLeod rivers. The McLeod River supports a relatively high level of canoeing, the reach between Steeper and the McLeod River campground probably receiving the highest level of use. This reach of the river has numerous rapids of which two are Class III. The McLeod River provides good water-based recreation opportunities and access should be maintained.

The Bighorn Trail, administered by Weldwood of Canada Ltd., runs through this RMA and receives hiking and equestrian use in the summer and some cross-country skiing in the winter. There are multiple use trails to Mystery Lake. Snowmobiling and OHV use also occur in this RMA. Some 4x4 clubs are interested in establishing and participating in the management of a 4x4 trail. Hunting and fishing occur in this RMA.

Objectives

1. To provide and maintain auto-access camping, day use facilities and water access opportunities.
2. To provide and maintain trails and staging facilities for equestrian, hiking and water-based recreation.
3. To maintain the recreational capability of specific areas and protect the McLeod River corridor (Zone 4), identified as having a high recreation potential, for present or future recreation use or development.
4. To recognize Highway 40 as the primary focus for auto touring opportunities and encourage development of scenic, historical and interpretive viewpoints, where appropriate.
5. To manage the visual landscape qualities along Highway 40 (i.e., to line of sight).
6. To support existing equestrian trail riding operations in the area and provide opportunities for additional operation, as demand warrants.
7. To encourage the maintenance and provision of commercial facilities and services in Cadomin.
8. To encourage commercial opportunities for extensive river recreation on the McLeod River.

Guidelines

1. Developments will be reviewed to minimize any impact on areas of high scenic values (e.g., visible from Highway 40). This will ensure the maintenance of their visual qualities.
2. Intensive recreation development is a priority in this area because of the existing infrastructure and good recreation opportunities.

Historical Resources

Archaeological - Archaeological studies conducted in this area have been limited to two coal-mine-related projects. These have resulted in substantial numbers of archaeological sites being recorded along smaller drainages back

from the main valleys. Although none have received extensive investigations, it can be stated on a provisional basis that they consist of the remains of prehistoric campsites and resource exploitation activities conducted sometime during the last 12 000 years, probably most likely during middle prehistoric times (7000-3000 years ago).

No systematic investigations have taken place along the major rivers, but from study results elsewhere in the region, it can be presumed that terraces (especially south-facing) and stream junctions have the highest potential for site occurrence in the RMA. These valleys served as the focal points for seasonal game movement as well as providing access corridors into a wide variety of local resource areas. It is expected that sites relating to both travel and resource exploitation will occur here.

Like the Robb Highlands RMA, the unexpectedly dense occurrence of prehistoric sites along smaller drainages back from main valleys is a feature of the prehistoric settlement pattern identified in this RMA. McPherson Creek is a good example of this, and it is expected that similar patterns will occur elsewhere.

The occurrence of sites on the shores of Mary Gregg Lake indicates that exploitation of aquatic resources is also a characteristic of prehistoric settlement patterns. Other lakes, including those too small to contain fish, also exhibit potential for site occurrence.

In a similar fashion to other regions within the Coal Branch, isolated ridges overlooking stream valleys and good grazing areas also have potential for site occurrence. These areas were used frequently for temporary campsites and workshops while observing game movements. Some of the bedrock-thrust ridges may have exposed geological formations containing chert, siltstone or other silicious stone suitable for stone tool manufacture. While primarily of palaeontological interest, prehistoric stone quarries may also be located in these areas.

Palaeontological - This RMA is representative of the foothills physiographic region. The area contains exposures of Lower to Upper Cretaceous marine and non-marine beds and Paleocene beds (Luscar, Blackstone, Cardium, Wapiabi, Brazeau and Paskapoo formations). Exposures are present in river valleys, road and railway cuts, mine sites and along ridges. Two significant fossil-producing areas are known in the RMA. These have produced dinosaur and plant remains. The area is considered to have high potential for the discovery of additional sites. Consequently, all major developments in the RMA, including coal-mines, limestone quarries and major roadwork, should be preceded by a palaeontological impact assessment.

Objective

1. The broad historical management objectives apply.

Guideline

1. The Archaeological Survey of Alberta will participate in the land use referral process to review developments proposed in areas of the RMA considered to have historical resource potential. The historical resources sensitivity map will outline areas of historical resources potential for which the Department of Culture and Multiculturalism will request referral of proposed development projects.

Rangeland

Presently, some horse grazing is provided within this RMA. Because of the limited expansion opportunities, only existing use levels can be maintained.

Objectives

1. To ensure that good range condition is maintained.

2. To maintain existing levels of authorized horse grazing.

Guidelines

1. The forage resource will be monitored and managed for authorized horse use.

2. The effects of uncontrolled horse use on the forage resources will be monitored.

3. Historical forage resource use by horses will be recognized and maintained since expansion opportunities are limited.

Settlement

The hamlet of Cadomin (Zone 8) is located in the McLeod River valley at the southern tip of this RMA. The community began as a coal-mining settlement in 1912. Before 1952, its population reached 2500 people. Today's population is estimated at 109. A nearby limestone quarry is the primary employer for the people of Cadomin. The hamlet also functions as a part-time residence for cottagers as well as a retirement centre for some people of the Coal Branch. The cottagers are primarily from the Edmonton region. Since the recreation potential of the surrounding area is significant, there may be opportunities to provide additional tourism services and facilities here.

Objective

1. To maintain the present hamlet boundaries of Cadomin and possibly expand them when a need is identified.

Guideline

1. The General Municipal Plan and Land Use Order for the Improvement District of Yellowhead, No. 14 will direct the development of settlements and of other rural residences.

Access

Highway 40 receives both industrial and recreational traffic. The Gregg River Road, a private log haul road, crosses this RMA. Other industrial roadways associated with the oil and gas industry are also located here. A new highway may be required should additional significant resource developments occur (e.g., coal mining).

Objectives

1. To provide a highway network that is responsive to the long-term resource activity and public road needs of the coal, oil and gas, forestry and tourism industries, public recreation needs and existing communities needs.

2. To maintain access to current industrial developments and communities served by Highway 40.

Guidelines

1. The maintenance of a scenic landscape quality along any new proposed highway will be considered for all resource developments visible from the roadway.

2. The rights to the land base required for re-alignment of Highway 40 will be protected.

3.6 Brule Lake Resource Management Area

The Brule Lake RMA is an area of approximately 64 km^2 (25 sq. mi.), forming the northwestern planning area boundary (Figure 9).

The area is within the Montane Ecoregion. Characteristic montane features include forest stands and grasslands, although Douglas fir, a major montane feature, is lacking. A main feature of the area is the windblown soil derived from the shores of Brule Lake. White spruce and balsam poplar, which are tolerant to such conditions, are common throughout the area. Active eolian dunes along the east shore of Brule Lake support patchy shrub communities, stunted balsam poplar and aspen.

Topography in the RMA is relatively flat. The dominant features are the sand dunes on the east shores of Brule Lake. This RMA's montane influence results in warmer winter temperatures and variable snow cover compared to the adjacent foothills and mountainous areas.

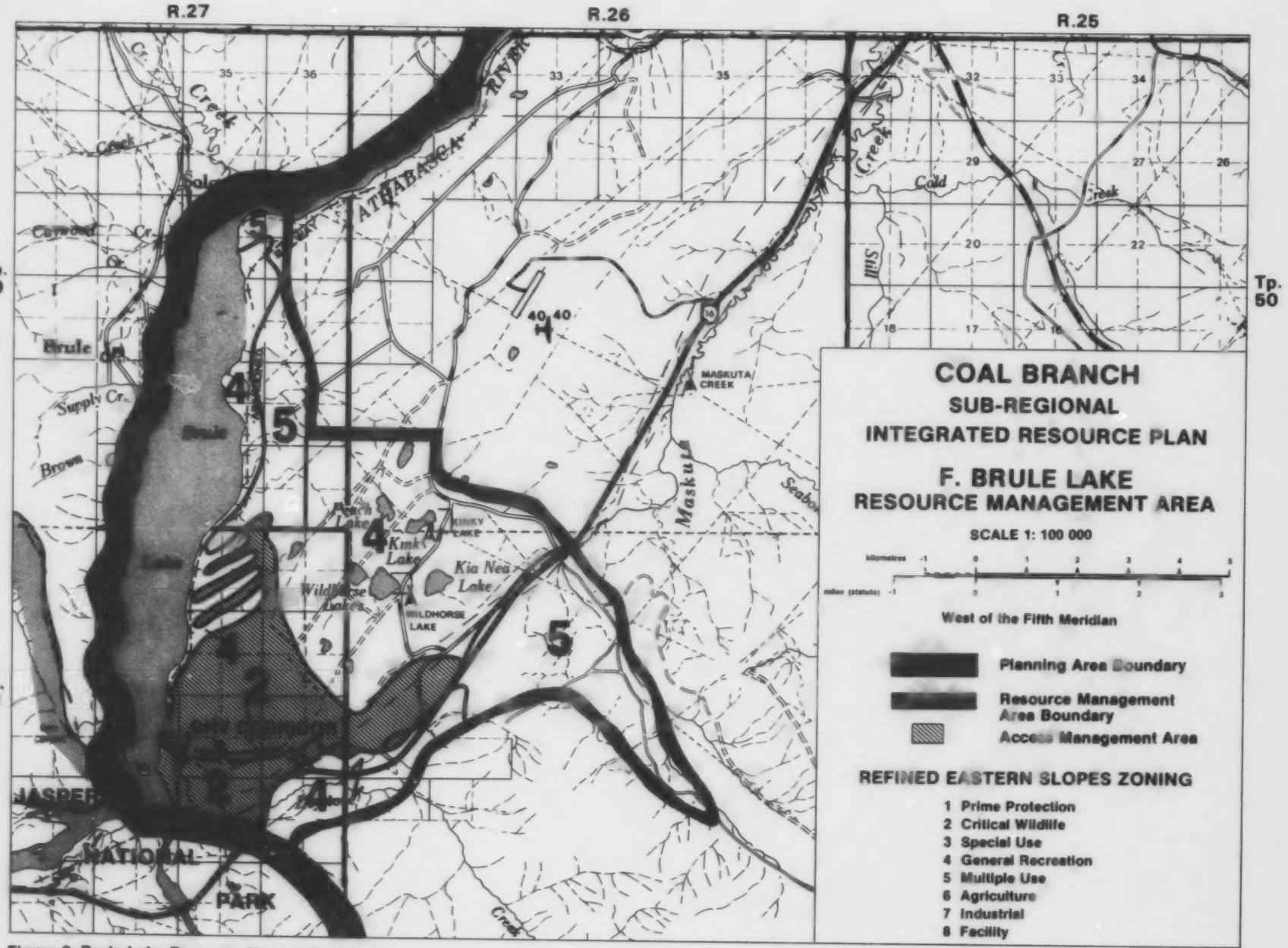

Figure 9: Brule Lake Resource Management Area.

The management intent for Brule Lake RMA is to retain the high visual qualities and protect the high wildlife, fisheries, recreational, tourism and historical resource values and sensitive soils. In addition, opportunities for intensive commercial recreation and tourism development will be provided while allowing for a limited range of multiple use activities.

In response to the various public interests for recreation and tourism resources, as well as other resources, a local integrated resource plan is recommended for the Yellowhead Corridor.

Water and Watershed

The RMA is drained by the Athabasca River and several creeks. The major drainages are Drystone Creek and a part of Maskuta Creek. These creeks generally exhibit steep gradients in the headwater areas and relatively stable channels. The area's eolian deposits, when combined with the relatively arid and windy climate, are prone to wind erosion when vegetation is removed or disturbed. Vegetation is also difficult to re-establish after disturbance. The non-vegetated sand dunes are more subject to displacement by the wind.

There are several lakes in this RMA, of which Brule Lake is the largest. Others include Peach, Kinky, Kia Nea and Wildhorse lakes.

Objectives

1. To protect eolian soils east of Brule Lake from wind and water erosion by minimizing impacts on the area's sensitive eolian deposits.

2. To preserve the water resources by minimizing negative impacts on the quality or quantity.

Guideline

1. Land and resource use activities will be subject to site specific guidelines regarding location, intensity and season of operation so as to minimize impacts on both the water resources and the sensitive eolian areas.

Minerals

Coal-bearing strata underlies 32 percent of this RMA. Only one coal deposit (Wildhorse Lakes) has been designated with remaining in-place reserves of two megatonnes of coal. Leases covering the deposit have been cancelled and the coal rights withdrawn from disposition.

Petroleum or natural gas fields have yet to be discovered here.

Objective

1. To provide opportunities for mineral exploration and development.

Guideline

1. The broad minerals management guidelines apply.

Timber

This RMA is within FMU E4N, and timber resources are harvested and managed by Weldwood of Canada Ltd.

Objectives

1. To ensure Weldwood of Canada Ltd. manages that portion of the FMA in the FMU E4N to provide a sustained yield of coniferous timber.

2. To ensure that the visual resources are protected along Highway 16 and the Athabasca River.

Guidelines

1. The detailed forest management plan for Weldwood of Canada Ltd. will be followed.

2. Timber harvesting within the line of sight of Highway 16 and Athabasca River will be planned according to the Forest Landscape Management Strategies for Alberta (Alberta, 1988c).

Wildlife

An important overwintering area for elk is located east of Brule Lake. Approximately 40 elk use the area. The rolling dune topography and associated vegetation provides good mule deer habitat. A long-toed salamander population is present near Kinky Lake. This is one of two known populations in Alberta outside the national parks. Hunting and wildlife viewing are both important recreation uses in the RMA.

Objectives

1. To manage the elk population to increase numbers from 40 to 50 animals.

2. To manage the mule deer population for a general increase in numbers.

3. To protect the rare long-toed salamander population near Kinky Lake from disturbance.

Guidelines

1. An access management area will apply to the Brule Lake Zone 2 area to prohibit year-round motorized recreational access and to promote use of forage areas by elk. However, a designated motorized recreation route will be provided through this Zone 2 area. This area is proposed for bow hunting only.

2. Critical thermal cover for elk will be retained within and adjacent to the Brule Lake Zone 2.

3. The spawning, hibernation and movement areas for long-toed salamanders in the Kinky Lake area will be protected from disturbance by protective reservation.

Fisheries

Kinky and Wildhorse lakes provide regionally significant rainbow trout and brook trout fisheries. Several other lakes in the area have potential for stocking as demand warrants. Brule Lake is generally too shallow and silt-laden to provide any recreational fishing potential. Mountain whitefish, rainbow trout and bull trout are present in the Athabasca River.

Objectives

1. To manage the fisheries resource of Kinky and Wildhorse lakes as stocked lake fisheries capable of providing an average catch rate of 0.5 fish per angler hour.

2. To stock the other lakes surrounding Kinky and Wildhorse lakes as demand warrants and where compatible with other resource values.

Guideline

1. Stocking of Kinky and Wildhorse lakes will continue at a level that allows an average catch rate of 0.5 fish per angler hour.

Recreation and Tourism

This RMA is adjacent to Jasper National Park and includes the Yellowhead Highway's gateway access to the park. A Jasper National Park management plan has been prepared that places restrictions on developments within the park. Therefore, potential exists in this RMA (including the corridor portion along Highway 16 in the Yellowhead RMA from Hinton west) to expand existing tourism operations and provide additional tourist services and facilities. These could cater to visitors using both Jasper National Park and the Coal Branch area, as well as the general travelling public. Currently, two private sector accommodations are located along Highway 16. They act as staging areas for recreation activities in the region.

The Brule Lake RMA offers excellent scenic views. The public expressed interest in

maintaining the visual landscape qualities along Highway 16.

Wildhorse and Kinky lakes, both popular fisheries, are the focal points for recreation use. Two Alberta Forest Service recreation areas are located here. These areas have a combined capacity of 23 campsites and 14 day use sites. The Department of Recreation and Parks has long-term intentions to develop the recreational potential of the Wildhorse-Kinky Lakes area. No detailed development plans have been prepared. However, the intent is to recognize the need for recreational facilities with a high level of servicing to accommodate travellers on the Yellowhead Highway (e.g., family vacation destination resort development). The area is intended for public recreational use, and the private sector will be encouraged to participate in the provision of services and facilities to accommodate and support this use.

The non-vegetated Brule sand dunes are regionally and locally popular for OHV recreation use. A portion of the Grand Trunk Pacific railway was located at one time along the east shore of Brule Lake. Some evidence of this remains on the dunes (e.g., telegraph poles, partial remains of a train station). The vegetated dunes are susceptible to disturbance and are thus better suited to extensive forms of non-motorized recreation.

Objectives

1. To maintain current public recreational facilities at Wildhorse and Kinky lakes.

2. To maintain the capability for future recreation development in the Wildhorse-Kinky lakes area (Zone 4).

3. To recognize touring opportunities along Highway 16 and the potential for associated facility developments (e.g., pull-off viewing areas, signs).

4. To recognize the Brule Lake sand dunes significance as a natural feature through interpretive signs and facilities.

5. To allow OHV recreation use on the Brule Lake non-vegetated sand dunes (Zone 4).

6. To manage the scenic landscape qualities along the Yellowhead Highway (i.e., to the line of sight), especially near the Jasper National Park entrance (Zone 4).

7. To support expansion of existing tourism facilities and services, as demand warrants.

8. To provide opportunities for commercial tourism developments and associated recreation activity developments.

9. To retain public access to public land along lakes, rivers and streams.

Guidelines

1. Timber harvesting and other developments within the line of sight of Highway 16 and the Athabasca River will be planned in an aesthetic manner.

2. Business counselling will be provided by the Department of Tourism to existing and potential tourism operators interested in expanding their operations or developing new tourist services or facilities.

3. The Department of Recreation and Parks, in conjunction with other agencies such as the Department of Tourism and the Department of Forestry, Lands and Wildlife, will work with any potential private sector operator interested in developing tourism and recreation opportunities on lands reserved by the Department of Recreation and Parks.

4. Development of scenic viewing or interpretive pull-off areas will be considered within the Highway 16 twinning program (from Edmonton to the junction of Highway 40). If found to be feasible, the departments of Tourism and Culture and Multicul-

turalism, as well as other interested agencies, will assist the Department of Transportation and Utilities in identifying sites along Highway 16 that have potential for development of pull-off areas.

5. The Department of Tourism will assist, where possible, in any endeavours by other government agencies or local groups interested in developing interpretive facilities and signs that are appropriate for the Brule Lake sand dunes area.

6. Dispositions that preclude public access along lakes (particularly the Kinky-Wildhorse lakes complex), rivers and major streams will not be issued.

Historical Resources

Archaeological - The Brule Lake RMA, the smallest RMA within the Coal Branch, consists of a broad flat valley initially carved by the Athabasca lobe of the Cordilleran ice sheet and later filled by glacial Lake Athabasca. This broad, open area was probably a major wintering zone for ungulates from adjacent areas that are now a part of Jasper National Park. The presence of these animals in Brule Lake undoubtedly provided a major attraction for prehistoric peoples. The fact that the Athabasca valley is a major corridor between interior British Columbia and Alberta is also a factor for consideration in determining the area's potential for prehistoric occupation.

A large number of sites have been identified on the shores of Brule Lake immediately west of the planning area boundary (one older than 8000 years), demonstrating the frequent use of this area during prehistoric times. Although possibly to a lesser extent, similar occurrences may be present along the shores of the lake within this RMA.

Elsewhere in the Brule Lake RMA, several sites have been recorded along smaller drainages (Maskuta and Drystone creeks). It is expected that additional finds could be made along these creeks. Sites identified on the shores of Wildhorse Lakes demonstrate the use of aquatic and wetland species in this area. It is also expected that the other small lakes and wetlands within the RMA will contain sites relating to exploitation of these resources around their margins. Finally, the alluvial gravels along the shores of the lake may have provided useable materials for stone tool manufacture and may suggest the presence of workshop sites nearby.

The possibility of very significant stratified sites exists in this area. Unlike many other portions of the planning area, soil deposition, which could have resulted in the geological separation of repeated occupations of the same landform, is an important feature of this region. The source of this soil deposition is windblown loess derived from glacial action up the valley. Sand dunes in this area are the most likely locations for such sites.

Palaeontological - To date, very little palaeontological investigation has occurred in this RMA, and there are no known fossil-producing sites in the area. However, the RMA is representative of the foothills physiographic region, which has produced fish and dinosaur remains in RMAs to the east. Exposures are present in river valleys, road-end railway cuts, abandoned mine sites and along ridges throughout the RMA, and the area is considered to have high potential for the discovery of fossil remains.

Historic Period - Historically, evidences of a past railway bed are still present in this RMA.

Objective

1. The broad historical management objectives apply.

Guidelines

1. Any major development in the RMA, such as coal-mining, limestone quarrying or road construction activities, should be preceded by a palaeontological impact assessment.

2. The Archaeological Survey of Alberta will participate in the land use referral process to review developments proposed in areas of the RMA

considered to have historical resource potential. The historical resources sensitivity map will outline areas of historical resources potential for which the Department of Culture and Multiculturalism will request referral of proposed development projects.

Rangeland

The demand for more rangeland for horse use will coincide with Hinton's increasing population and with the tourist industry's needs. At present, some horse-holding areas and limited grazing opportunities are provided.

Objectives

1. To encourage the expansion opportunities for grazing where compatible with other resource uses.

2. To encourage intensified management of forage resources and grazing opportunities in order to meet local need.

3. To ensure that good range condition is maintained.

Guidelines

1. Range management plans must recognize the need for intensive management of vegetation on eolian soils.

2. Grazing opportunities will be provided on a need basis and in consideration of wildlife, recreation and tourist values.

3. Authorized horse use of the forage resources will be monitored and managed.

Settlement

The Drystone Subdivision is within this RMA. This subdivision is for recreational-type developments.

Objectives

1. To encourage further recreational developments to occur within the Drystone Subdivision.

2. To encourage consideration of the area's visual aesthetic quality in all further developments.

Guideline

1. Resource management agencies will consult with the Improvement District of Yellowhead, No. 14 when determining land uses on a site-specific basis.

Access

Gateway access to Jasper National Park is provided through this RMA. The Department of Transportation and Utilities is currently twinning Highway 16 (up to the junction of Highway 40). It is recognized that access routes for developments along the highway will be extremely limited west of the Drystone Subdivision. Reasons for this access limitation are topography and safety.

An access management area will apply to the Brule Lake Zone 2 area. An OHV access corridor will be provided through this area to the Brule Lake non-vegetated sand dunes area.

Objectives

1. To protect the visual qualities along the Yellowhead Highway (to line of sight).

2. To recognize the limited opportunities for roadway intersections onto Highway 16, west of the Drystone Subdivision.

3. To provide an OHV access corridor through the Brule Lake Zone 2 access management area.

Guidelines

1. Motorized vehicle access requests along Highway 16 will be reviewed by all interested agencies.

2. The maintenance of a scenic landscape quality along Highway 16 will be considered for all resource developments that are visible from the Yellowhead Highway.

3. An access management area restricting motorized recreation use will apply to the Brule Lake Zone 2. However, a motorized recreation access corridor will be provided through this Zone 2 area. The corridor will provide access from Highway 16 and the Overlander Lodge to the Brule Lake non-vegetated sand dunes area.

3.7 Mountain Park-Folding Mountain Resource Management Area

The Mountain Park-Folding Mountain RMA is an area of approximately 583 km^2 (225 sq. mi.) in the western portion of the planning area (Figure 10).

Ecoregions represented include Boreal Uplands, Subalpine and Alpine with the Subalpine and Alpine ecoregions covering the greatest area. In the subalpine areas, Engelmann spruce and subalpine fir are co-dominant. However, because of past fire history, a young lodgepole pine forest is more extensive. In Alpine areas, the vegetation varies depending on a number of factors including type of substrate, exposure to winds and insolation, slope steepness, moisture conditions and snow accumulation. Tree growth is restricted to scattered stunted subalpine fir and Engelmann spruce, which occur at lower elevations in depressional and less exposed sites. Heather communities are the dominant ground cover on gently sloped north aspects often associated with stunted tree growth. Lodgepole pine with subdominant white spruce and black spruce are the common tree species in the Boreal Uplands Ecoregion, which is found at elevations lower than the Subalpine Ecoregion.

Terrain in the Mountain Park-Folding Mountain RMA is variable and rugged, ranging from steeply sloped, forest-covered foothills to the high, barren mountain peaks characteristic of the Rocky Mountains front ranges with its rugged, sharply peaked northwesterly trending ranges and valleys.

The management intent for the Mountain Park-Folding Mountain RMA is to recognize a varied range of provincially significant resources such as coal, wildlife, extensive recreation, tourism and historical resources. A limited range of other multiple use activities will also be provided, while recognizing the importance of watershed protection.

Water and Watershed

Being mainly within the Alpine and Subalpine ecoregions, this RMA produces relatively high volumes of clean water. The headwaters of the McLeod River are in the Mountain Park and Cardinal Divide area. Streams in these headwaters have high gradients, low drainage density and high runoff efficiency. This results in a quick initial response to storms. The stream channels have low banks and coarse, gravelly beds. Major tributary creeks in the McLeod River headwaters include Whitehorse, Harlequin, Drummond, Cadomin, Prospect, Thornton and Cheviot.

Drinnan, Sphinx and Berrys creeks are tributaries of the Gregg River which also starts in the northern portion of this RMA. They flow through rugged, mountainous terrain.

Slope steepness is a concern in watersheds throughout the RMA. However, because the soils are generally shallow, coarse and often calcareous, erosion and water quality concerns are minor. Soil conservation practices will be required to maintain the productivity of the area because of the shallowness of the soil resources. Overall, extensive resource developments are less of a concern than the larger intensive developments that can be difficult to reclaim and have a potentially negative impact on both water quality and quantity.

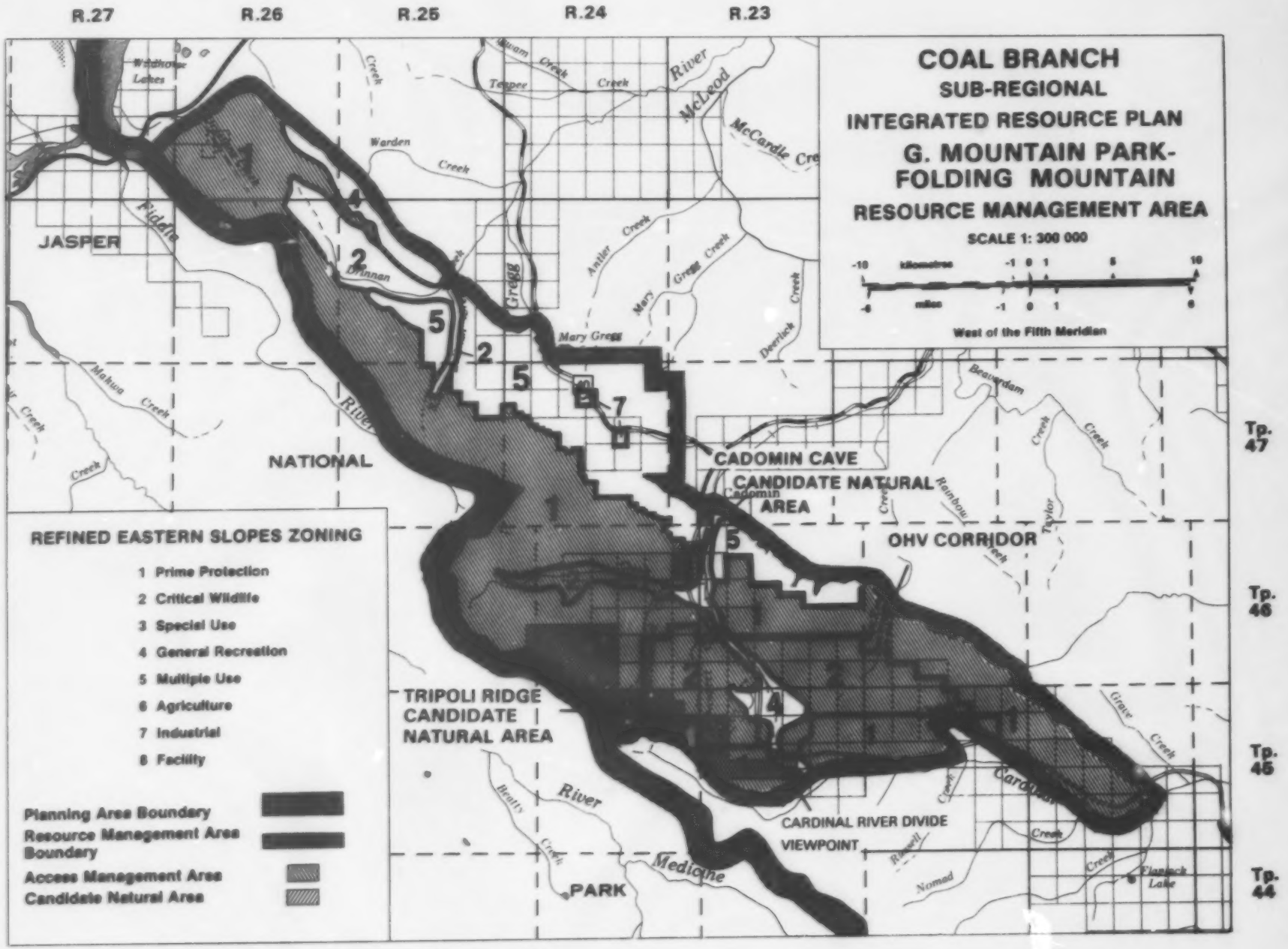

Figure 10: Mountain Park-Folding Mountain Resource Management Area.

Objectives

1. As much as possible to protect the shallow soil resources from erosion and/or loss by various land use activities.

2. To ensure that existing and future resource developments do not result in unacceptable changes in water quality or quantity.

Guideline

1. Due to the high value for quality water yield in the McLeod River drainage, land and resource use activities will be subject to very specific guidelines regarding location, intensity and season of operation so as to protect the sensitive areas (e.g., steep slopes, shallow soils).

Minerals

Forty-two percent of this RMA is underlain by coal-bearing strata that contains a readily accessible supply of high quality, metallurgical grade coals that are essential to Alberta's export trade. Four hundred and ninety megatonnes of clean coal resource have been identified in the designated Cadomin-Luscar and Mountain Park coalfields. The two coal-mines, Gregg River and Cardinal River, are presently operating in the RMA. The mine processing plants (Zone 7) and mine permit areas are within this RMA. The Mountain Park project is also located in the southern part of the RMA.

Petroleum or natural gas fields have yet to be discovered here.

Seven limestone quarrying leases are located in this RMA. One major limestone quarry is operating just south of Cadomin. This area has extensive quarriable resources.

Objectives

1. To provide opportunities for coal exploration and development while recognizing other resource values and environmental sensitivity.

2. To allow for continued coal resource development that could take advantage of the existing infrastructure.

3. To consider other resource values when locating mineral development, processing and transportation facilities.

4. To provide opportunities for the development of limestone and other minerals.

5. To provide opportunities for petroleum and natural gas exploration and development while recognizing environmental sensitivity and other resource values.

Guidelines

1. Coal exploration will not be allowed in Prime Protection Zone areas except that:

   (a) Coal exploration will be considered on a case-by-case basis but only where coal leases presently exist under Coal Category 4, where a significant need for exploration has been identified, and where the impacts can be suitably mitigated.

   (b) Application for coal exploration in the Folding Mountain area will be considered under the existing approval processes, and where a significant need for exploration has been identified and where the impacts can be suitably mitigated.

2. In general, mineral development will not be allowed in the Prime Protection Zone. However, applications to allow development on existing coal leases in the Prime Protection Zone and under Coal Category 4, will be considered. Public review will be coordinated at the public disclosure stage of a coal development proposal and the plan amendment stage. No coal activity will occur on those portions of coal leases in Coal Category 1 and the Prime Protection Zone.

3. Coal exploration and development in the Critical Wildlife Zone and the General Recreation Zone adjacent to Folding Mountain will be permitted under the existing approval processes, providing the value of the area to wildlife and recreation can be maintained. To maintain the wildlife values in the Critical Wildlife Zone, mineral activities should avoid important habitat areas as much as possible. Where avoidance is not possible, the project must be designed to minimize disturbance of wildlife habitat and undertake mitigative measures to maintain habitat capability in or adjacent to the project area. Reclamation will have wildlife habitat as a high priority in the Critical Wildlife Zone.

4. Coal exploration and development in the Mountain Park Critical Wildlife Zone and General Recreation Zone area will be allowed under the existing approval processes and will not be prevented or pre-empted by other interim land uses. In the Critical Wildlife Zone, coal exploration and development will be allowed with a commitment from the developer to ensure maintenance of adequate useable habitat to allow elk population objectives to be met.

5. Development of the existing quarrying mineral lease on the west side of the McLeod River may occur only if there are no significant impacts on the stability of the Cadomin Cave or on the bat population that uses the cave. An independent geotechnical study will be required before a quarry development decision is taken and before the Cadomin Cave area is established as a natural area.

6. The quarry lease in the Whitehorse Creek valley is in the Prime Protection Zone and therefore no quarry activity will be allowed.

Timber

This RMA is largely within the E5 FMU, although it does include small portions of the E4, E4N and E11 FMUs. Since most of the RMA is in the Alpine or Subalpine ecoregions, the timber is generally either unmerchantable or unharvestable because of steep slopes. Timber management in this RMA will, therefore, focus on salvage of any merchantable timber in advance of coal-mining or sanitation harvesting i.e., selective cutting to prevent the spread of insects or disease.

Objectives

1. To manage the forest resources with emphasis on protection from fire, insects and disease.

2. To ensure maximum use of the timber resource.

3. To ensure reclamation of coal-mining areas to merchantable forest production, where the forest capability is favourable.

4. To maintain a healthy and stable forest resource.

Guidelines

1. Timber management through sanitation treatments or salvage operations will be carried out on timber affected by fire, insect or disease.

2. Timber salvaging will be required on merchantable timber cut during other resource developments.

Wildlife

Approximately 550 bighorn sheep inhabit the front ranges within this RMA. Valuable sheep habitat is located on Redcap Mountain, the headwaters of Whitehorse and Prospect creeks, Gregg River and Cardinal River mine sites and Folding Mountain. Mountain goat populations in the RMA are relatively low, at approximately 20 animals. Approximately 90 elk are present, primarily in important habitat in the Whitehorse Creek,

Prospect Creek and Mountain Park areas. The desired further expansion of elk numbers to historical levels is impeded by a high level of access and off-highway vehicle disturbance.

The Cadomin Cave is a valuable habitat for bats. It provides a major hibernacula for 2000 bats and in the fall, is inhabited by 20 000 bats consisting of three species and a subspecies that is recorded at only one other location in Alberta.

A large number of recreational days are spent hunting and viewing wildlife in the RMA. Trophy bighorn sheep and elk hunting opportunities are provided.

Objectives

1. To increase the elk population from 90 to 200 animals, primarily in the Whitehorse Creek, Prospect Creek, Mountain Park area.

2. To maintain the bighorn sheep population of approximately 550 animals.

3. To increase the mountain goat population from 20 to 100 animals.

4. To protect Cadomin Cave (Zone 1) as valuable bat habitat.

Guidelines

1. An access management area prohibiting motorized recreation use will apply to all Zone 1 areas as well, as the Whitehorse Creek Zone 2 area, to manage OHV use in order to help expand elk and maintain sheep populations, and to reduce erosion and user conflicts.

2. Further elk or mountain goat transplants into the Prospect Creek Zone 2 area will not be carried out at present OHV levels.

3. Escaped/abandoned horses should be controlled to limit competition with elk.

4. Motorized recreation use disturbances in sheep and goat habitat will be minimized year-round through the access management area.

5. The potential for mountain goat transplants into Harlequin Creek and its tributaries, Drummond Creek, Whitehorse Creek and Fiddle Pass areas will be assessed by the Fish and Wildlife Division.

6. Mine reclamation plans which provide bighorn sheep habitat enhancement will be encouraged.

7. Public access and use of the Cadomin Cave will not be promoted during the bats' swarming and hibernation periods of August 10 to April 30.

Fisheries

Rainbow trout, bull trout, mountain whitefish and brook trout are present in many of the headwater streams in the RMA. Although several streams have limitations to fisheries due to steep gradients, recreational fishing is good in a number of creeks, especially in the Whitehorse Creek-McLeod River area. Drinnan Creek is an important bull trout spawning area. A number of creeks in the Luscar area have been degraded through coal-mining activities.

Objectives

1. To maintain a recreational bull trout fishery in Mystery Lake.

2. To manage bull trout as a naturally reproducing stream fishery.

3. To maintain or enhance the rainbow trout population native to the Athabasca drainage.

4. To manage Drinnan Creek as a naturally reproducing bull trout stream suitable for recreational fishery.

Guidelines

1. Size limits and low catch and possession limits will be maintained on bull trout in order to retain viable populations.

2. Rainbow trout native to the Athabasca drainage will be protected from hybridization with other rainbow trout and cutthroat trout.

Recreation and Tourism

This RMA has good tourism and recreation potential because of natural features such as the Folding Mountain area, Cadomin Cave, the Whitehorse Creek, Mountain Park and Cardinal Divide areas and the Grave Flats Road. This area is well suited for dispersed and extensive forms of recreation. That portion of the RMA south of Cadomin receives the most intensive recreation use of all the Coal Branch. More specifically, areas adjacent to the Grave Flats Road receive the greatest amount of recreation use. Highway 40 also provides auto access into the RMA.

A high level of OHV use occurs in the old coal-mining areas adjacent to Mountain Park, and AFS has recently upgraded the Mountain Park staging area to accommodate 30 to 35 vehicles. Year-round OHV touring is also popular throughout the Mountain Park area. Other recreation activities occurring here include snowmobiling, cross-country skiing, hunting, fishing, random camping, hiking, equestrian use, scenic and wildlife viewing as well as auto touring. Concerns have been expressed by the public regarding motorized and non-motorized recreation (e.g., management of OHVs, user conflicts).

The Whitehorse Creek valley receives a high level of equestrian, OHV and hiking use. In winter, cross-country skiing and snowmobiling occurs here. For some non-motorized users, Jasper National Park is a major destination area through Fiddle Pass. The Alberta Forest Service also operates a recreation area at Whitehorse Creek with 25 campsites. This campground has been upgraded and expanded. The nearby Prospect Creek is also a high use area. Cadomin Cave near Whitehorse Creek is popular. The overall Whitehorse Creek valley is a popular recreation and tourist destination point.

Another popular recreation area within this RMA is the Folding Mountain and Drinnan Creek to Mystery Lake area. This area receives a moderate level of hiking and equestrian use. It also represents a seasonal access point into Jasper National Park's Miette Hot Springs. Some interest groups favour designation of the Folding Mountain area as a wildland recreation area.

The Cardinal Divide viewpoint, maintained by AFS, has eight day use sites and is located adjacent to the Grave Flats Road. The public supports the designation of a parking lot that would discourage indiscriminate parking on the Cardinal Divide. The Divide's visual qualities are a tourism attraction, and interpretive and scenic viewpoint signs could provide information to visitors about the Divide.

Hunting and sportfishing opportunities are available in this RMA.

This RMA is attractive to tourists because of the above-noted natural features and opportunities to participate in a variety of recreation activities. Tourism opportunities, such as lodge development, commercially serviced campground, trail riding, outfitting and cave tours, could support these recreation activities. A preliminary assessment of the Cadomin Cave indicates that general cave tours, such as a show cave, may not be feasible at this time because of market and development costs as well as safety concerns. The cave is better suited for education and adventure cave tours.

Cadomin, located in the McLeod RMA, provides some services for visitors using this RMA. Items that could be interpreted which may be of interest to visitors relate to the history (e.g., former community of Mountain Park, Mountain Park Cemetary, remnants of the former rail branch line), wildlife viewing, natural and geological features (e.g., Folding Mountain, Cadomin Cave), and resource industries past and present (e.g., Luscar Mine's open pit viewpoint).

Objectives

1. To maintain the recreational capability of specific areas (e.g., Folding Mountain, Whitehorse Creek, Mountain Park, Cadomin Cave) having a high present recreation value or potential for future recreation and tourism development or use.

2. To recognize the auto touring opportunities along the Grave Flats Road and Highway 40.

3. To entertain proposals for commercial tourism developments and associated recreation developments.

4. To provide and maintain trails and associated support facilities for off-highway vehicles, snowmobiling, cross-country skiing and hiking in the Mountain Park area. To protect the sensitive resources of the Mountain Park area from overuse, motorized and non-motorized recreation trails will be identified through an access management plan for the Mountain Park Zone 2 area.

5. To maintain trails and staging facilities for equestrian and hiking use in the Whitehorse Creek area.

6. To entertain applications for commercial trail riding permits at Mystery Lake and along Whitehorse Creek.

7. To encourage development of interpretive opportunities (e.g., signs, tours) based on past and present industrial activities (i.e., coal and timber industries).

8. To manage and protect the scenic landscape qualities along Grave Flats Road (i.e., to line of sight).

9. To maintain the Cardinal Divide's recreation and tourism opportunities.

Guidelines

1. Extensive recreation will be encouraged in the higher elevation backcountry areas.

2. Intensive recreation developments and activities will be encouraged at lower elevations along highway corridors.

3. The potential for private sector operated tours of the Cadomin Cave will be maintained. Counselling advice will be available to potential operators interested in developing caving tours. Visitor safety and maintaining the integrity of the cave system will be an important consideration in development of the tours.

4. Any major road upgrading plans for the Grave Flats Road should assess the feasibility for scenic viewing and interpretive pull-off areas with interpretive signs. If feasible, the departments of Tourism and Culture and Multiculturalism will assist the Department of Transportation and Utilities in identifying appropriate sites.

5. The Department of Tourism will, upon request, provide consulting assistance to groups interested in establishing industrial or historical tours for the public.

6. Groups will be encouraged through Alberta Forest Service programs to participate in the maintenance of OHV trails in Mountain Park.

Historical Resources

Archaeological - The Mountain Park-Folding Mountain RMA consists primarily of the slopes leading to the front ranges for the Rocky Mountains. Few archaeological studies have taken place within the boundaries of this RMA. Portions of a coal-mining study and an assessment of a small Alberta Forest Service campsite constitute the only studies to date.

Both of the above studies resulted in the identification of small prehistoric sites. The

Whitehorse Creek rock shelter is the most significant of these. It consists of the remains of consecutive small scale occupations (hearths, stone artifacts, bone fragments) dating back longer than 3700 years and well separated within soil profiles 45 cm in depth. Proximity to the more steep slopes of the mountains may have resulted in a greater change for similarly stratified cultural materials throughout this RMA.

The physical relief of this RMA indicates that the prehistoric sites which may occur here will relate to the use of high elevation species such as ungulates (mountain sheep, possibly elk and caribou), roots of alpine plants and possibly bedrock formations containing workable cherts and siltstones. High elevation adaptations are a known but poorly understood aspect of the prehistory of the province. Although the sites are probably small, their study would be of major scientific value.

The most probable locations for sites are along the stream valleys that drain the alpine uplands and provide access into these areas. Small lakes would have attracted the upland grazers and may also be the location of prehistoric sites. Bedrock exposures of materials suitable for stone tool manufacture would most probably have been the sites of prehistoric quarries and workshops. An additional potential for important archaeological sites occurs in the possible use of cave and rock shelters as campsites. These provide the possibility of stratified and very ancient cultural occupations.

Palaeontological - Very little fieldwork has been conducted in the RMA; however, it is considered to have high potential for the discovery of significant palaeontological sites. This RMA is representative of the front ranges physiographic region. The front ranges of the mountains include exposures of Upper Paleozoic, Triassic, Jurassic and Cretaceous age. Vertebrate remains have not been reported in this region to date, but invertebrate fossils are frequent in the RMA. Exposures are present in river and stream cuts, quarry and mine operations, and along ridges and exposed slopes.

All major developments, including coal-related operations, limestone quarries and any road development in this RMA should be preceded by a palaeontological impact assessment.

Natural - The Department of Culture and Multiculturalism views the Cadomin Cave as being of potential provincial historic significance.

Objective

1. To recognize the Cadomin Cave as being of potential provincial historic significance.

Guidelines

1. A Historical Resource Impact Assessment may be required before any industrial developments occurs that may have an impact on the stability of the Cadomin Cave.

2. The Archaeological Survey of Alberta will participate in the land use referral process to review developments proposed in areas of the RMA considered to have historical resource potential. The historical resources sensitivity map will outline areas of historical resources potential for which the Department of Culture and Multiculturalism will request referral of proposed development projects.

Ecological Resources

Two natural features are noteworthy. The Cadomin Cave represents a cultural, biological and ecological resource proposed as a conservation natural area (to include the access trail, cave entrance, known passages, predicted cave extensions, an interesting sulphur spring and an archaeological dig site) which requires protection from quarrying. It is also a potential tourist attraction. Refer to the Minerals, Wildlife and Historical sections of this RMA for details. Also see Figure 10.

The cave is relatively well known. The upper chambers are easily accessible and are fairly well used by the general public and

organized groups. There are signs of vandalism and littering at the cave entrance. Spray painting is evident on rocks at the entrance, and rock surfaces surrounding the entrance have also been defaced. At present, there is no management of the cave.

The other location with noteworthy natural features is the Tripoli Ridge area. See Figure 10. It includes part of the Cardinal Divide, and has been proposed as a conservation natural area. There is some evidence that it escaped the last glaciation, leaving a particularly rich alpine plant community. The area contains a number of rock glaciers (one of which is unique in the province), a large number of rare plant species, unique vegetation types and areas of sensitive alpine tundra. In summary, its various biological features are unique in the province.

Objectives

1. To protect the Cadomin Cave system as a culturally, biologically and ecologically significant resource.

2. To recognize the ecological significance of the proposed Tripoli Ridge Natural Area.

Guidelines

1. Unrestricted public access to the Cadomin Cave will be maintained.

2. The Cadomin Cave's existing tourism opportunities are recognized.

3. The Cadomin Cave's cultural, biological and ecological resource significance will be protected.

4. A protective notation will act as a holding mechanism for the Cadomin Cave and Tripoli Ridge sites until the form of any further protection, such as natural area designation, is approved and established.

Rangeland

Some horse grazing and horse-holding areas are provided in this RMA. Most horse grazing relates to the recreation use of the area. Much of this recreation use relates to the use of backcountry trails.

Objective

1. To ensure that good range condition is maintained.

Guidelines

1. Surveys of range condition and forage use on backcountry equestrian trails will be conducted.

2. Supplemental feeding of horses to minimize impacts on limited natural resources will be encouraged.

3. Authorized horse use of the forage resources will be monitored and managed.

Access

A part of Highway 40 is within the RMA. The Grave Flats Road south of Cadomin continuing to the Cardinal Divide is recognized as a recreation corridor with recreation activities being more concentrated near the roadway and becoming more dispersed further off the roadway. It is recognized that this road may also be required by the coal industry in the future.

The access management area will provide for motorized and non-motorized recreation use areas in this RMA. The public supports restricting OHV use in the Cardinal Divide area because of its ecological significance and sensitive vegetation.

Objectives

1. To maintain Highway 40 access to current industrial developments and recreational sites.

2. To meet the traffic needs of the coal and tourism industries and recreational users along the Grave Flats Road.

3. To manage motorized recreation use in the RMA.

Guidelines

1. If required in the future, access for coal development will be provided on the Grave Flats Road.

2. The access management area will include all Zone 1 areas, the Whitehorse Creek Zone 2 area and the Mountain Park Zone 2 area. The access management area restricts motorized recreation use in all Zone 1 areas as well as the Whitehorse Creek Zone 2 area. A motorized recreation route will be provided through the MacKenzie Creek Gap. Motorized and non-motorized recreation trails will be identified through the access management plan for the Mountain Park Zone 2 area (Figure 10).

3. Road development at the Cardinal Divide will be limited to the existing Zone 4.

3.8 Nikanassin Resource Management Area

The Nikanassin RMA is an area of approximately 238 km^2 (92 sq. mi.) along the southwest boundary of the planning area (Figure 11).

This RMA is within the Alpine and Subalpine ecoregions. Vegetative cover varies depending on the type of substrate, exposure to winds and sun, slope steepness, moisture conditions and snow accumulation. Tree growth is restricted to scattered, stunted subalpine fir and Engelmann spruce, which occur at lower elevations in depressional and less-exposed sites. Heather communities are the dominant ground cover on sheltered, gently sloping, northern aspects often associated with stunted tree growth.

Terrain in the Nikanassin RMA is very rugged, consisting of sharply peaked, northwesterly trending ranges and valleys of the Rocky Mountain front ranges.

The management intent for the Nikanassin RMA is to protect the environmentally sensitive vegetation, watershed and aesthetic values, while providing an extensive backcountry wilderness recreation experience.

Water and Watershed

The entire RMA is within the Alpine and Subalpine ecoregions, and produces relatively high volumes of clean water. The RMA is part of the North Saskatchewan River basin and contains the entire headwaters of the Cardinal River and Thistle Creek, a major tributary of the Brazeau River. The major creeks of the Cardinal drainage within this RMA include Toma, Chimney and Ruby.

Bedrock is either at or near the surface throughout the RMA. The soil that exists is very shallow and coarse. There are very few erosion concerns because of limited land use activity and the little potential for future development.

Objectives

1. To maintain the integrity of the watercourses and stream flows because of their inherent importance to downstream users of the North Saskatchewan River Basin.

2. To protect the shallow soil resources from damage by land use activities.

Guideline

1. The North Saskatchewan River Basin yields large volumes of high quality water. Consequently, any land or resource use activities will be subject to very specific guidelines regarding location, intensity and season of operation to protect the sensitive areas (e.g., steep slopes, shallow soils).

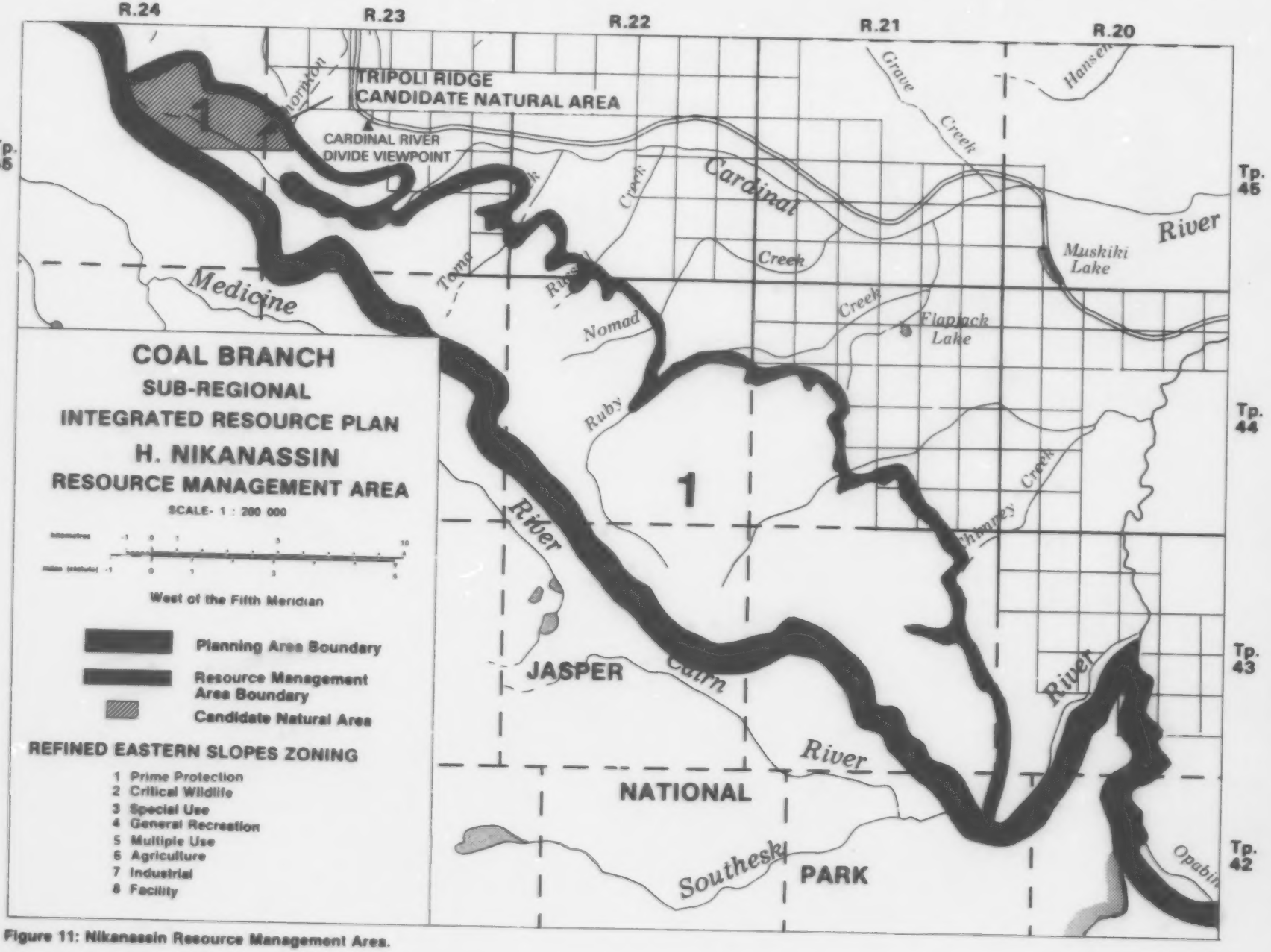

Figure 11: Nikanassin Resource Management Area.

Minerals

About 15 percent of the RMA is underlain by potential coal-bearing strata; however, little is known of this and no exploration has been undertaken.

Petroleum or natural gas fields have not yet been discovered here.

There are no objectives since mineral activity is not allowed in this RMA.

Timber

With this RMA being entirely within the Alpine and Subalpine ecoregions, the timber resources are either unmerchantable or unharvestable. Sanitation treatments or harvesting to prevent the spread of insects or disease is therefore the only timber harvesting activity that will be considered in this portion of the E11 FMU.

Objective

1. To maintain a healthy and stable forest resource.

Guideline

1. Timber management through selective sanitation cutting will occur. Timber threatened by fire, insects or disease may be salvaged.

Wildlife

This RMA consists of steep alpine and subalpine terrain. Relatively unproductive forage areas are reflected in the comparatively low populations of bighorn sheep, mountain goat and elk. Mountain goats are the only ungulate with potential for a population increase.

Objectives

1. To maintain the current population of bighorn sheep and elk.

2. To increase the mountain goat population from 6 to 50 animals.

Guideline

1. The potential for mountain goat transplants into the headwater area of Thistle, Ruby, Chimney and Toma creeks and the Cardinal River will be assessed by the Wildlife Branch of the Fish and Wildlife Division.

Fisheries

Steep headwaters limit habitation of many watercourses by fish, although some creeks have resident bull trout populations. These headwater areas are important as water source areas for productive fisheries downstream.

Objective

1. To manage bull trout as a naturally reproducing stream fishery.

Guideline

1. Size limits and low catch and possession limits will be maintained on bull trout in order to retain viable populations.

Recreation and Tourism

Most of this RMA is mountainous and best suited for dispersed forms of recreation such as hiking and equestrian use. Access to Jasper National Park is available through the Rocky and Southesk passes. Jasper's equestrian facilities at Southesk Lake encourage equestrian travel through this RMA.

Tourism opportunities in this RMA are associated with the extensive backcountry recreation activities that occur here, such as equestrian trail riding and hiking.

Objectives

1. To maintain the backcountry recreational opportunities and associated support facilities (i.e., staging areas) with the major emphasis on equestrian and hiking trails.

2. To manage recreation use in cooperation with Jasper National Park.

3. To protect the aesthetic quality of this RMA for recreation use.

4. To encourage equestrian trail riding operations in the area.

5. To explore opportunities for designation of snowmobile routes in this RMA.

Guideline

1. Snowmobile trails may be allowed if compatible with other resource values.

Historical Resources

Archaeological - The Nikanassin RMA encompasses the slopes of the Rocky Mountain front ranges. No archaeological studies have taken place in this region, but it can be presumed to have a potential similar to that described for the Mountain Park-Folding Mountain RMA.

Historic Period - Historically, the RMA was peripheral to areas of coal-mining and forestry activities.

Objective

1. The broad historical management objectives apply.

Guideline

1. The Archaeological Survey of Alberta will participate in the land use referral process to review developments proposed in areas of the RMA considered to have historical resource potential. The historical resources sensitivity map will outline areas of historical resources potential for which the Department of Culture and Multiculturalism will request referral of proposed development projects.

Ecological Resources

A part of the Tripoli Ridge area proposed for a conservation natural area is within this RMA. For a description of the Tripoli Ridge area, refer to the ecological section in the Mountain Park-Folding Mountain RMA.

Objective

1. To recognize the ecological significance of the proposed Tripoli Ridge conservation natural area.

Guideline

1. A protective notation will act as a holding mechanism for the Tripoli Ridge site until the type of protection, such as natural area designation, is approved and established.

Rangeland

Equestrian use is a suitable recreation activity in this RMA. Although little use occurs today, this area's aesthetic qualities and access to Jasper National Park has the potential to attract more use.

Objective

1. To ensure that good range condition is maintained.

Guidelines

1. If greater equestrian use occurs, the use of the forage will be monitored and supplemental feeding will be required.

2. Authorized horse use of the forage resources will be monitored and managed.

4.0 PLAN MANAGEMENT

General administrative procedures and mechanisms required for plan implementation, monitoring and amendment are outlined in this chapter.

4.1 General Administration

Once approved, the Coal Branch Sub-Regional Integrated Resource Plan will be implemented within the terms of appropriate legislation, regular programs and activities of the government, operational plans, specific development projects and referral processes. The revised zoning provides a means of processing applications for new public land dispositions within the planning area. Existing systems for referral and interdepartmental review will apply to the plan. Resources will continue to be administered by the departments responsible, in line with approved zoning, resource management guidelines and, any operational plans.

Government management agencies participating in the Coal Branch Sub-Regional Integrated Resource Plan will have several responsibilities to ensure effective delivery of this plan. It will be their responsibility to deal with conflicts or concerns with respect to implementation or interpretation of any of the plan's provisions. These responsibilities are outlined by subject area below.

Referral Systems: Participating government management agencies will ensure that existing referral systems of the Alberta government are adequate to encompass all affected or concerned agencies.

Plan Monitoring: The Coal Branch Sub-Regional Integrated Resource Plan will be reviewed annually by the Eastern Slopes Regional Resource Management Committee to:

- assess the relevancy of the stated resource objectives in light of changing conditions;
- assess the resource management guidelines and referral procedures;
- assess agency operational plans to ensure their consistency with the Coal Branch resource management area intents, objectives and guidelines; and
- recommend amendments to the Coal Branch Sub-Regional Integrated Resource Plan and future actions required to maintain or promote government resource management activities in the planning area.

An annual report will be prepared by the Eastern Slopes Regional Resource Management Committee. The report will highlight the previous year's activities in the planning area. It will also indicate what might be expected to be accomplished in the planning area during the next year. The report may be deferred if there is a lack of activity or progress on government resource management objectives within the planning area.

On a periodic basis (approximately every five years), an overall assessment of the plan will be conducted by the Eastern Slopes Regional Resource Management Committee. If the plan is found to be no longer current, a major plan review will occur.

For example, a major plan review would occur when the plan is considered out-of-date due to significant resource changes or new priorities. This review would include:

- a comprehensive review of all aspects of the plan, including but not limited to resource management objectives and guidelines, land-use zoning, and resource management area boundaries and intents;
- a public review similar to the public review involved in the development of new integrated resource plans; and
- a statement recommending amendments to the plan and future actions required to maintain or

promote government resource management activities in the planning area.

4.2 Amendment Procedures

Changes to the planning area boundary, broad planning area resource management objectives, land use zoning, and the resource management area boundaries and intents that would result in significant changes to the allowed resource uses or priorities will require major amendments to the Coal Branch plan. An amendment to the plan may be required as a result of an annual review, government requests or a request from an individual, group or organization outside the government.

Proposed amendments to the Coal Branch Sub-Regional Integrated Resource Plan from outside the government should be made by formal application to the Assistant Deputy Minister of the Public Lands Division, Alberta Forestry, Lands and Wildlife*. Opportunities for public review of significant amendments to the Coal Branch plan will be provided before changes are approved by the government.

The decision to consider requests to amend an integrated resource plan rests with the Minister of Forestry, Lands and Wildlife or his designate. Amendments that entail a major policy decision or a change to the basic intent of the plan may be forwarded by the Minister to Economic Planning Cabinet Committee for review and approval.

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*Guidelines for preparing requests for amendments to integrated resource plans are available upon request from the Resource Planning Branch of Alberta Forestry, Lands and Wildlife in Edmonton.

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APPENDIX A

LEGISLATION AND ASSOCIATED DIRECTION

Numerous government directives must be considered while developing an integrated resource plan. The most significant directions to the Coal Branch plan are discussed below.

A.1 A Policy for Resource Management of the Eastern Slopes

A Policy for Resource Management of the Eastern Slopes, Revised 1984 (Alberta, 1984a) provides guidelines and objectives for integrated resource management and planning for the entire Eastern Slopes region, including the Coal Branch planning area. The Eastern Slopes Policy relies on regional land use zoning to designate large areas of land for varying degrees of protection, resource management and development.

Table 1 lists the general intent for each of the following eight land use zones: 1) Prime Protection; 2) Critical Wildlife; 3) Special Use; 4) General Recreation; 5) Multiple Use; 6) Agriculture; 7) Industrial; and 8) Facility. The overriding principle for all the zones under A Policy for Resource Management of the Eastern Slopes Revised 1984 (Alberta, 1984a) is to protect the valuable water resources of the Eastern Slopes and to provide for public land and resource use in a manner consistent with principles of conservation and environmental protection. The zoning does not apply to privately owned lands in the planning area.

Table 2 defines a range of compatible activities to enact the intent of the eight land use zones. The compatible activities and zoning found in the Eastern Slopes Policy provide only interim direction until sub-regional integrated resource plans are completed.

A.2 Fish and Wildlife Policy for Alberta

The Fish and Wildlife Policy for Alberta was approved by Cabinet and released in October 1982. This policy provides general direction regarding outdoor recreation, wildlife resources, fisheries resources and regulatory aspects of fish and wildlife use. The Fish and Wildlife Policy calls for preparation of comprehensive 10-year fish and wildlife resource plans. Meeting the objectives stated in this plan will achieve a part of the overall fish and wildlife projected demand targets identified in the Status of the Fish and Wildlife Resource in Alberta (Alberta, 1986b).

A.3 Position and Policy Statement on Tourism

The Position and Policy Statement on Tourism (June 1985) states that "it is the government's role to encourage a climate in which tourism can prosper and grow." Identified elements relative to this encouragement, and which may affect land use planning, include assisting private sector to upgrade/improve facilities and services; assisting other levels of government, such as municipalities, to develop and smooth the way for further development of related recreational and tourist opportunities; minimizing regulations affecting tourism services; and providing adequate protection for significant natural and cultural resources.

A.4 Plans under the Planning Act

The Planning Act provides for the planning and regulation of land uses and the pattern of human settlement. All private development, except as exempted under the Planning Act, shall be subject to the Planning Act. The Crown is not bound by the Act. Instruments used under The Planning Act include regional plans, general municipal plans, area structure plans, area redevelopment plans and in the case of improvement districts, land use orders.

The planning area is wholly within the Yellowhead Regional Planning Commission and the Improvement District of Yellowhead, No. 14. The Yellowhead Regional Plan has been approved by the Alberta Planning Board and ratified by the Minister of Municipal Affairs. A general municipal plan is being prepared for the Improvement District of Yellowhead, No. 14. The revised Improvement District of Yellowhead, No. 14 land use order will reflect

Table 1: Intents of the Eastern Slopes Policy Zones.

No.	Zone	Intent of the Zone
1	Prime Protection	To preserve environmentally sensitive terrain and valuable ecological and aesthetic resources.
2	Critical Wildlife	To protect specific fish and wildlife populations by protecting aquatic and terrestrial habitat crucial to the maintenance of those populations.
3	Special Use	To recognize historical resources, scientific research areas and lands that have unique management requirements or legislative status, or which cannot be accommodated elsewhere.
4	General Recreation	To retain a variety of natural environments within which a wide range of outdoor recreation opportunities may be provided.
5	Multiple Use	To provide for the management and development of the full range of available resources, while meeting long-term objectives for watershed management and environmental protection.
6	Agriculture	To designate lands that are used currently or are considered suitable for cultivation or improved grazing.
*7	Industrial	To recognize existing or approved industrial operations such as coal-mines, gas processing plants and forest product mills.
8	Facility	To recognize existing or approved settlement and commercial development areas.

For more detail, refer to A Policy for Resource Management of the Eastern Slopes - Revised 1984, ENR Number T/38. Edmonton.

* Note: Generally, industrial sites 16 ha (40 ac.) or more are recognized as Zone 7, while those less than 16 ha in size are recognized as Zone 5.

TABLE 2: COMPATIBLE ACTIVITIES BY LAND USE ZONE [1]

ACTIVITY	ZONE 1 PRIME PROTECTION	2 CRITICAL WILDLIFE	3 SPECIAL USE	4 GENERAL RECREATION	5 MULTIPLE USE	6 AGRICULTURE	7 INDUSTRIAL	8 FACILITY
Non-motorized recreation	■	■	□	■	■	■	□	■
Fishing	■	■	□	■	■	■	□	■
Hunting	■	■	□	□	■	■	□	×
Scientific study	■	□	□	□	■	■	■	■
Trapping	■	□	□	□	■	■	×	×
Trails; non-motorized	□	□	□	■	■	■	□	■
Transportation and utility corridors	□	□	□	□	■	■	■	■
Primitive camping	□	□	□	■	■	■	×	×
Intensive recreation	□	×	□	■	■	□	□	■
Off-highway vehicle activity	×	□	□	□	■	■	■	■
Logging	×	□	□	□	■	■	■	□
Domestic grazing	×	□	□	□	■	■	×	□
Petroleum and natural gas exploration and development	×	□	□	□	■	■	■	□
Coal exploration	×	□	□	□	■	■	■	×
Coal development	×	□	□	□	■	■	■	×
Mineral exploration and development	×	□	□	□	■	■	■	×
Serviced camping	×	□	□	■	■	□	□	■
Commercial development	×	×	□	□	□	□	□	■
Industrial development	×	×	□	×	■	□	■	□
Residential subdivisions	×	×	□	□	□	■	□	■
Cultivation	×	×	□	×	□	■	□	□

■ Compatible Use -Uses that are considered to be compatible with the intent of a land use zone under normal guidelines and land use regulations.

□ Permitted Use -Uses that may be compatible with the intent of a land use zone under certain circumstances and under special conditions and controls where necessary.

× Not-Permitted Use -Uses that are not considered to be compatible with the intent or capabilities of a land use zone.

These activities are only representative of the range of activities that occur in the Eastern Slopes. For these and any other activities, the possibility of whether they should or should not take place in a particular area must always be measured against the fundamental management intentions for that zone. Since economic opportunities are not all known in advance, site-specific developments may be considered in any zone.

[1] From "A Policy for Resource Management for the Eastern Slopes-Revised 1984"

the general municipal plan. Although not a statutory plan, a land use study has been completed for the Hinton-Jasper corridor by the Improvement District. It will be used as a guide to land use planning.

The airport vicinity protection area regulations, which apply to both the Hinton and Edson airports, are enacted under Section 147 of the Planning Act.

Coordination between the provincial government and local governments is essential to ensure the intents and contents of instruments under the Planning Act and integrated resource plans are consistent with one another. While IRPs apply only to public land and resources and have no legal status, they do represent government policy over the vast majority of the planning area.

A.5 Commercial Trail Riding Policy

As an outcome of the Commercial Trail Riding Policy, "Commercial Trail Riding Regulations" were established for the Green Area in 1979 under the Public Lands Act. In part, these regulations establish three classes of trail riding management areas: single operator (class I), multiple operator (class II) and multiple operator day-use (class III).

A.6 Wilderness Areas, Ecological Reserves and Natural Areas Act

The Wilderness Areas, Ecological Reserves and Natural Areas Act (1981) consolidated the policy context for these three separate programs under one act.

Ecological reserves are to be designated to protect representative landscapes of the province. The act provides the public with the opportunity to submit recommendations regarding wilderness areas and ecological reserves.

Natural areas, which are scattered throughout the province, were previously established under the Public Lands Act or were held under reservation. These areas have a broader set of acceptable uses than ecological reserves or wilderness areas, including recreation, education and conservation.

There are no wilderness areas as defined by this act in the Coal Branch.

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Fishing	■	■	□	■	■	■	□	■
Hunting	■	■	□	□	■	■	□	×
Scientific study	■	□	□	□	■	■	■	■
Trapping	■	□	□	□	■	■	×	×
Trails; non-motorized	□	□	□	■	■	■	□	■
Transportation and utility corridors	□	□	□	□	■	■	■	■
Primitive camping	□	□	□	■	■	■	×	×
Intensive recreation	□	×	□	■	■	□	□	■
Off-highway vehicle activity	×	□	□	□	■	■	■	■
Logging	×	□	□	□	■	■	■	□
Domestic grazing	×	□	□	□	■	■	×	□
Petroleum and natural gas exploration and development	×	□	□	□	■	■	■	□
Coal exploration	×	□	□	□	■	■	■	×
Coal development	×	□	□	□	■	■	■	×
Mineral exploration and development	×	□	□	□	■	■	■	×
Serviced camping	×	□	□	■	■	□	□	■
Commercial development	×	×	□	□	□	□	□	■
Industrial development	×	×	□	×	■	□	■	□
Residential subdivisions	×	×	□	□	□	■	□	■
Cultivation	×	×	□	×	□	■	□	□

■ Compatible Use -Uses that are considered to be compatible with the intent of a land use zone under normal guidelines and land use regulations.

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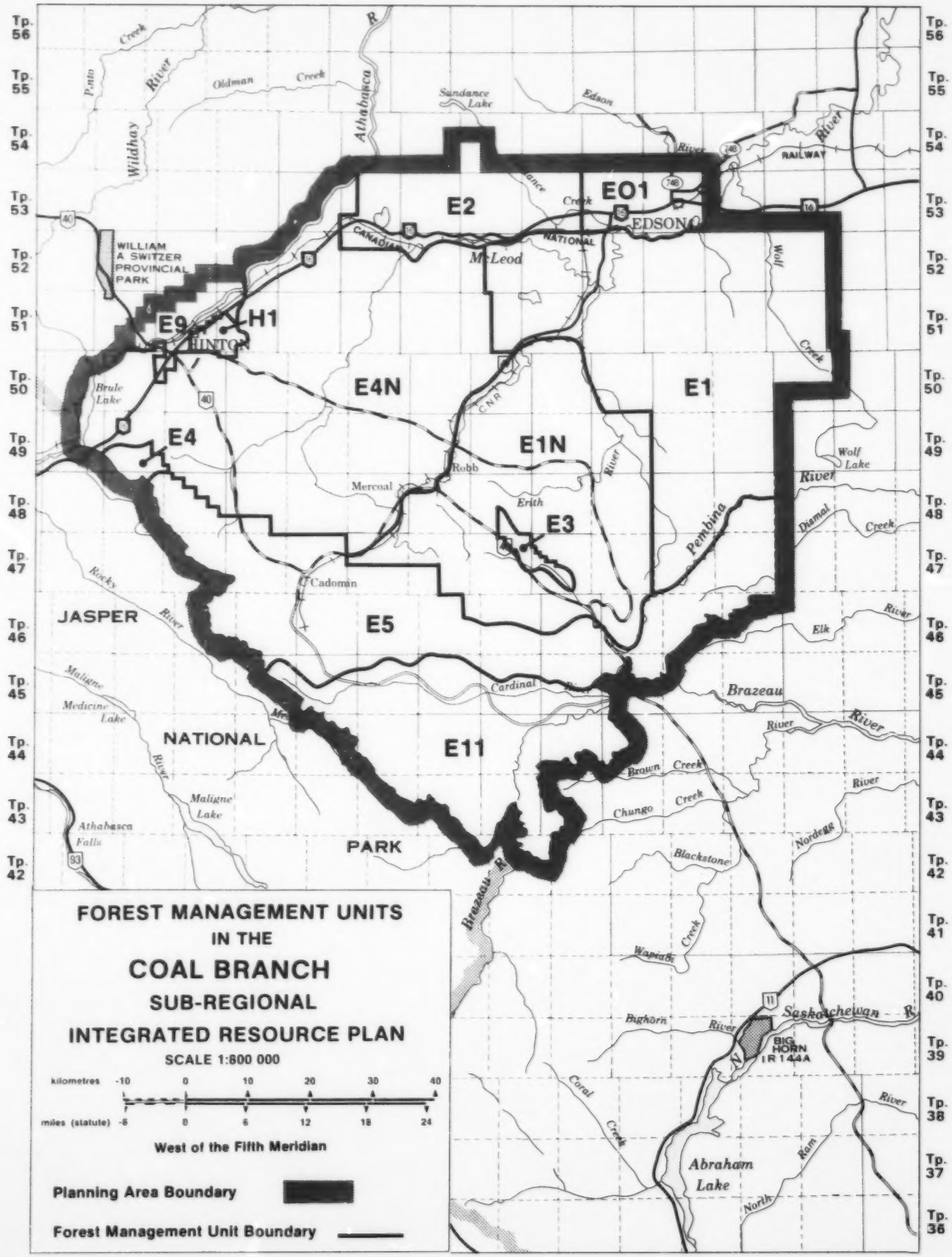
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Wildhay River
Oldman Creek
Athabasca R.
Sundance Lake
Edson
River
RAILWAY
E2
EO1
EDSON
Creek
CANADIAN
NATIONAL
McLeod
Wolf Creek
WILLIAM A SWITZER PROVINCIAL PARK
E9
H1
HINTON
Brule Lake
E4N
E1
C.N.R.
E4
E1N
Robb
Mercoal
Erith
E3
Wolf Lake
River
Pembina
Dismal Creek
Rocky River
Cadoman
JASPER
E5
Elk River
Maligne
Medicine Lake
Cardinal
Brazeau
River
NATIONAL
E11
Brown Creek
Chungo Creek
Maligne Lake
Athabasca Falls
PARK
Nordegg
Blackstone
Brazeau R.
Wapiabi Creek
Saskatchewan R.
Bighorn River
BIG HORN IR 144A
Coral Creek
Abraham Lake
Ram River
North
FOREST MANAGEMENT UNITS
IN THE
COAL BRANCH
SUB-REGIONAL
INTEGRATED RESOURCE PLAN
SCALE 1:800 000
kilometres -10 0 10 20 30 40
miles (statute) -6 0 6 12 18 24
West of the Fifth Meridian
Planning Area Boundary
Forest Management Unit Boundary

GLOSSARY

Access Management Area (AMA)	An area where management of motorized recreational use must be considered in recognition of other concerns.
Agricultural Development	Includes improved grazing, forage or crop production.
Annual Allowable Cut (AAC)	The total volume of timber that may be harvested in one year based on sustained-yield.
Animal Unit Month (AUM)	A measure of forage or feed required to maintain one animal unit (i.e., a mature cow of 455 kg [1000 lb.or equivalent] with or without an unweaned calf for a period of 30 days.
Archaeological Resource	"...a work of man that (i) is primarily of value for its prehistoric, historic cultural or scientific significance, and (ii) is or was buried or partially buried in land in Alberta or submerged beneath the surface of any watercourse of permanent body of water in Alberta", as recognized by the Department of Culture and Multiculturalism.
Carrying Capacity	The maximum number of animals that can graze annually on a given range for a specific period of time, without inducing a downward trend in forage production, forage quality or soil.
Coal Category 1	A classification of lands for coal exploration and development in which no exploration or commercial development will be permitted. This category includes national parks, present or proposed provincial parks, wilderness areas, natural areas, restricted development study areas, watershed research study basins, designated recreation areas, designated heritage sites, wildlife sanctuaries, settled urban areas and major lakes and rivers. These are areas for which it has been determined that alternative land uses have a higher priority than coal activity. Category 1 also includes most areas associated with high environmental sensitivity; these are areas for which reclamation of disturbed lands cannot be assured with existing technology, and in which the watershed must be protected. (A Coal Development Policy for Alberta, 1976).
Coal Category 4	A classification of lands for coal exploration and development in which exploration or commercial development will be permitted. In this category, exploration may be permitted under appropriate control, and surface or underground mining or in situ operations may be considered subject to proper assurances respecting protection of the environment

	and reclamation of disturbed lands. (A Coal Development Policy for Alberta, 1976).
Commercial Timber Permit (CTP)	Authorization for the permittee to harvest permit timber and which identifies lands on which timber may be harvested, the period of time within which the timber may be harvested, the actual timber to be harvested, and the terms and conditions on which the permit is issued (Forest Act, RSA 1980, c. F-16).
Critical Habitat	Habitat that is crucial to the size, distribution or stability of a wildlife or fish population. Loss of such habitat would result in a drastic decline or local extirpation of a population.
Deciduous Timber Allocation (DTA)	A long-term right to harvest deciduous timber on a percentage share of the allowable harvest in an FMU.
Disposition	Dispositions may be of a permanent nature as through the sale of land, or may be temporary as when rights to particular lands or resources, either surface or subsurface, are granted for a finite period of time. The most common forms of disposition are by sale, lease, licence or permit.
Ecoregion	An area defined by a distinctive regional climate as expressed by vegetation.
Edaphic/Climax	A vegetational climax created by localized changes in the topography, soil, water conditions, fire or other disturbances such that the climatic climax cannot develop.
Eolian	Sediment generally consisting of medium-to-fine sand and coarse silt particle sizes that are well-sorted, poorly compacted and may show internal structures such as cross-bedding or ripople laminae, or may be massive. These materials have been transported and deposited by wind action.
Fen	Peatland comprising neutral to acidic accumulations of organic materials, mainly derived from sedges. A mineral-rich water table persists very near the surface.
Forest Management Agreement (FMA)	An agreement between the Province of Alberta and a timber company granting authority to the company to manage and harvest timber. FMAs are usually contingent on the company agreeing to construct a large wood processing facility and manage the FMA by sound forest management principles approved by AFS. FMAs are awarded by orders-in-council.

Forest Management Unit (FMU)	An area of forest land managed as a unit for wood fibre production and other renewable resources.
Green Area	The Green Area was established by order-in-council in 1948. It consists basically of the non-settled forest lands and covers 53 percent of the total area of the province of Alberta. Public lands in this area are managed primarily for forest production, watershed protection, fish and wildlife management, recreation and other multiple uses. Permanent settlement, except on legally subdivided lands, and agricultural uses other than grazing, have been excluded (Alberta Public Lands, Alberta, 1988a).
Historical Resource	"...any work of nature or of man that is primarily of value for its palaeontological, archaeological, prehistoric, historic, cultural, natural, scientific or aesthetic interest including, but not limited to, a palaeontological archaeological, prehistoric, historic, or natural site, structure or object", as recognized by the Department of Culture and Multiculturalism.
Historic Site	"...any site which includes or is comprised of an historical resource of an immovable nature or which cannot be disassociated from its context without destroying some or all of its value as an historical resource and includes a prehistoric, historic or natural site or structure", as recognized by the Department of Culture and Multiculturalism.
Historical Resources Impact Assessment	Projects normally instituted in conjunction with development programs that are anticipated to cause ground surface disturbance within the Province of Alberta. The objective of such projects is to locate all historical resource sites to be affected by the development program, to evaluate the worth of such sites relative to Alberta's historical resources as a whole, to determine the nature of the impact of the development program on individual sites, and to propose conservation procedures for those sites to be affected by the development program as recognized by the Department of Culture and Multiculturalism. (Interim Guidelines)
Landscape Logging	(a) Identifying and rating the visual importance of present and potential timber harvesting operations. (b) Ensuring that timber harvesting operations blend with the natural landscape in areas where there is a concern for visual quality.

Local Timber Permit (LTP)	A timber permit issued normally to local residents authorizing the cutting of coniferous or deciduous timber for volumes up to a maximum of 750 m^3 coniferous or 1500 m^3 deciduous timber, and expiring April 30 of any given year.
Loess	Material transported and deposited by wind and consisting of predominantly silt-sized particles.
Miscellaneous Timber Use (MTU)	Timber made available for use by local residents under Local Timber Permits, which are issued without competition.
Off-Highway Vehicle (OHV)	Motorized vehicle used for cross-country travel on land, water or snow, including four-wheel-drive vehicles, motorcycles, track vehicles and snow vehicles, but not motorboats (Off-Highway Vehicle Act, RSA 1980, c. 0-4). In the context of this plan, off-highway vehicles do not include helicopters.
Operating Ground Rules	Standard ground rules employed by the AFS to guide the harvesting of timber. These are intended to both protect environmental quality and promote the growth of timber.
Palaeontological	"...a work of nature consisting of or containing evidence of extinct multicelluar beings and includes those works or classes of works of nature designated by the regulations as palaeontological resources." As recognized by the Department of Culture and Multiculturalism.
Public Land	Public lands held by the Crown in the right of Alberta.
Quota	Quotas convey coniferous or deciduous timber rights expressed as a percent shared of the annual allowable cut for a given FMU. Quotas are used to allocate commercial quantities of timber within specified areas to individual companies and have a 20-year term.
Reach	A part or section of a watercourse.

Referral System	The Alberta government has established formal mechanisms for the internal review of land use applications originating from within the Alberta government and the private sector. Government management agencies concerned or affected by the provisions of an application participate in its review. Subsequent to the review, each management agency files its recommendation for approval or rejection of the application. These positions are coordinated by a lead agency (i.e., "one window" approach) which, in turn, provides the proponent with a comprehensive decision.
Riparian Habitat	A vegetation zone influenced by groundwater, subirrigation (areas where a high water table reaches and/or saturates the root zone) or surface water, and which provides important habitat for fish and a majority of wildlife species. This vegetation is often a transition zone between aquatic habitat and upland terrestrial habitat.
Salvage Cutting	A cutting (timber harvesting method) made to use dead, downed and injured trees before the timber becomes unmerchantable.
Sanitation Cutting	Selective cutting (timber harvesting) to remove dead, diseased, infested, damaged or susceptible trees to reduce or prevent the spread of insects or pathogens.
Sustained-Yield Timber Management	The balancing of timber growth and harvesting production to ensure continued forest productivity at a given level of management without impairing the productivity of the land.
White Area	Available public lands in this region suitable for settlement and agriculture and not required for conservation, recreational uses, fish and wildlife habitat, watershed or forestry, for example, may be applied for pursuant to the Public Lands Act.